

TL60 TL80

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THE IMAGES USED IN THIS MANUAL ARE USED AS AN ILLUSTRATIVE EXAMPLES. THEY COULDN'T REPRODUCE THE DESCRIBED MODEL FAITHFULLY.

UNLESS OTHERWISE SPECIFIED, THE INFORMATION GIVEN IN THIS MANUAL ARE REFERRED TO ALL MODELS IN PRODUCTION AT THE ISSUE DATE OF THIS DOCUMENT.

GENERAL SAFETY INFORMATION

Your attention is drawn to the following actions that could compromise the characteristics of the product:

- Read and retain the instructions which follow.
- Follow all indications and instructions given on the device.
- Make sure that the surface on which the device rests is stable. If it is not, the device could fall, seriously damaging it.
- Make sure that the device rests on a hard (non-padded) surface and that there is sufficient ventilation.
- When positioning the device, make sure cables do not get damaged.
- Use the type of electrical power supply indicated on the device label. If uncertain, contact your dealer.
- Make sure the electrical system that supplies power to the device is equipped with a ground wire and is protected by a differential switch.
- Do not block the ventilation openings.
- Do not insert objects inside the device as this could cause short-circuiting or damage components that could jeopardize printer functioning.
- Do not carry out repairs on the device yourself, except for the normal maintenance operations given in the user manual.
- Make sure that there is an easily-accessible outlet with a capacity of no less than 15A in the vicinity of where the device is to be installed.
- Periodically perform scheduled maintenance on the device to avoid dirt build-up that could compromise the correct, safe operation of the unit.
- Before any type of work is done on the machine, disconnect the power supply.
- Do not touch the head heating line with bare hands or metal objects. Do not perform any operation inside the printer immediately after printing because the head and motor tend to become very hot.

GENERAL INSTRUCTIONS

CUSTOM ENGINEERING S.p.A. declines all responsibility for accidents or damage to persons or property occurring as a result of tampering, structural or functional modifications, unsuitable or incorrect installations, environments not in keeping with the equipment's protection degree or with the required temperature and humidity conditions, failure to carry out maintenance and periodical inspections and poor repair work.



THE CE MARK AFFIXED TO THE PRODUCT CERTIFY THAT THE PRODUCT SATISFIES THE BASIC SAFETY REQUIREMENTS.

The device is in conformity with the essential Electromagnetic Compatibility and Electric Safety requirements laid down in Directives 2006/95/CE and 2004/108/CE inasmuch as it was designed in conformity with the provisions laid down in the following Standards:

- EN 55022 Class B (*Limits and methods of measurements of radio disturbance characteristics of Information Technology Equipment*)
- EN 55024 (*Information Technology Equipment – Immunity characteristics – Limits and methods of measurement*)
- EN 60950 (*Safety of information equipment including electrical business equipment*)



GUIDELINES FOR THE DISPOSAL OF THE PRODUCT

The crossed-out rubbish bin logo means that used electrical and electronic products shall NOT be mixed with unsorted municipal waste. For more detailed information about recycling of this product, refer to the instructions of your country for the disposal of these products.

- Do not dispose of this equipment as miscellaneous solid municipal waste, but arrange to have it collected separately.
- The re-use or correct recycling of the electronic and electrical equipment (EEE) is important in order to protect the environment and the wellbeing of humans.
- In accordance with European Directive WEEE 2002/96/EC, special collection points are available to which to deliver waste electrical and electronic equipment and the equipment can also be handed over to a distributor at the moment of purchasing a new equivalent type.
- The public administration and producers of electrical and electronic equipment are involved in facilitating the processes of the re-use and recovery of waste electrical and electronic equipment through the organisation of collection activities and the use of appropriate planning arrangements.
- Unauthorised disposal of waste electrical and electronic equipment is punishable by law with the appropriate penalties.



The format used for this manual improves use of natural resources reducing the quantity of necessary paper to print this copy.

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1 INTRODUCTION

1.1 Document structure

This document includes the following chapters:

1	INTRODUCTION	information about this document
2	DESCRIPTION	general description of device
3	INSTALLATION	information required for a correct installation of the device
4	OPERATION	information required to make the device operative
5	CONFIGURATION	description of the configuration parameters of the device
6	MAINTENANCE	information for a correct periodic maintenance
7	SPECIFICATION	technical specification for the device and its accessories
8	CONSUMABLES	description and installation of the available consumables for the device
9	ACCESSORIES	description and installation of the available accessories for the device
10	ALIGNMENT	information required for managing the paper alignment
11	TECHNICAL SERVICE	information required for contacting the technical service

1.2 Explanatory notes used in this manual

NOTE: Information or suggestions relative to the use of the printer.

ATTENTION: Information required to guard against damaging the printer.

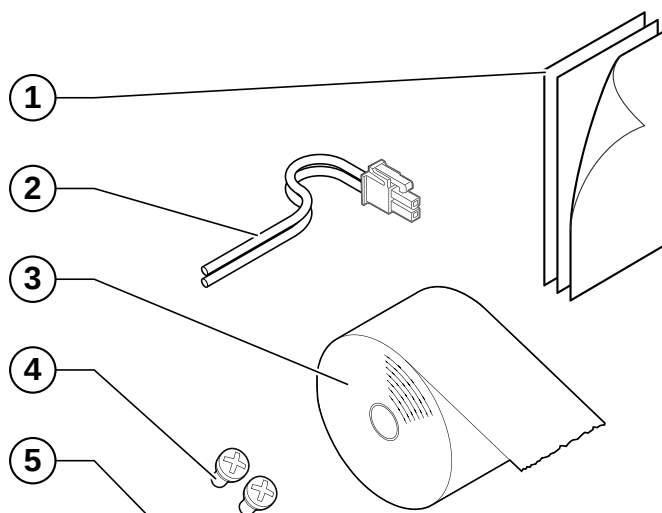
DANGER: Information required to guard against operator injury or damage.

2 DESCRIPTION

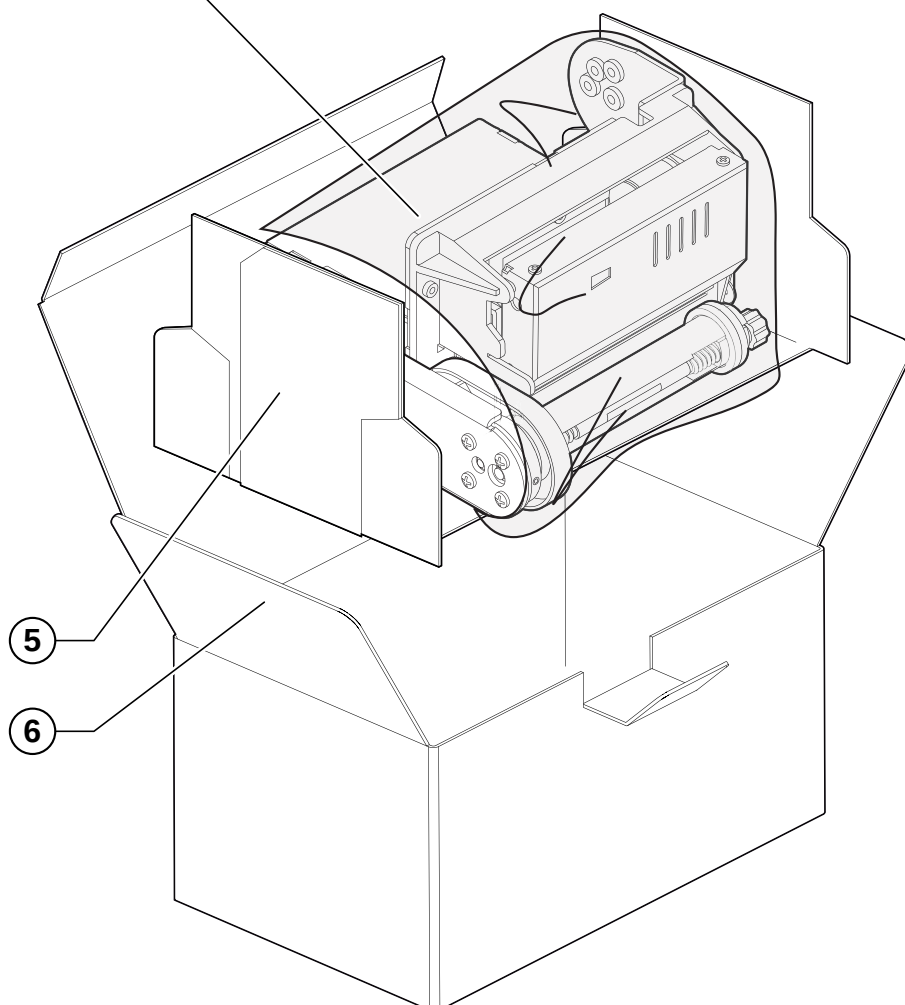
2.1 Unpacking the printer

Remove the printer from its carton being careful not to damage the packing material so that it may be re-used if the printer is to be transported in the future. Make sure that all the components illustrated below are present and that there are no signs of damage. If there are, contact Customer Service.

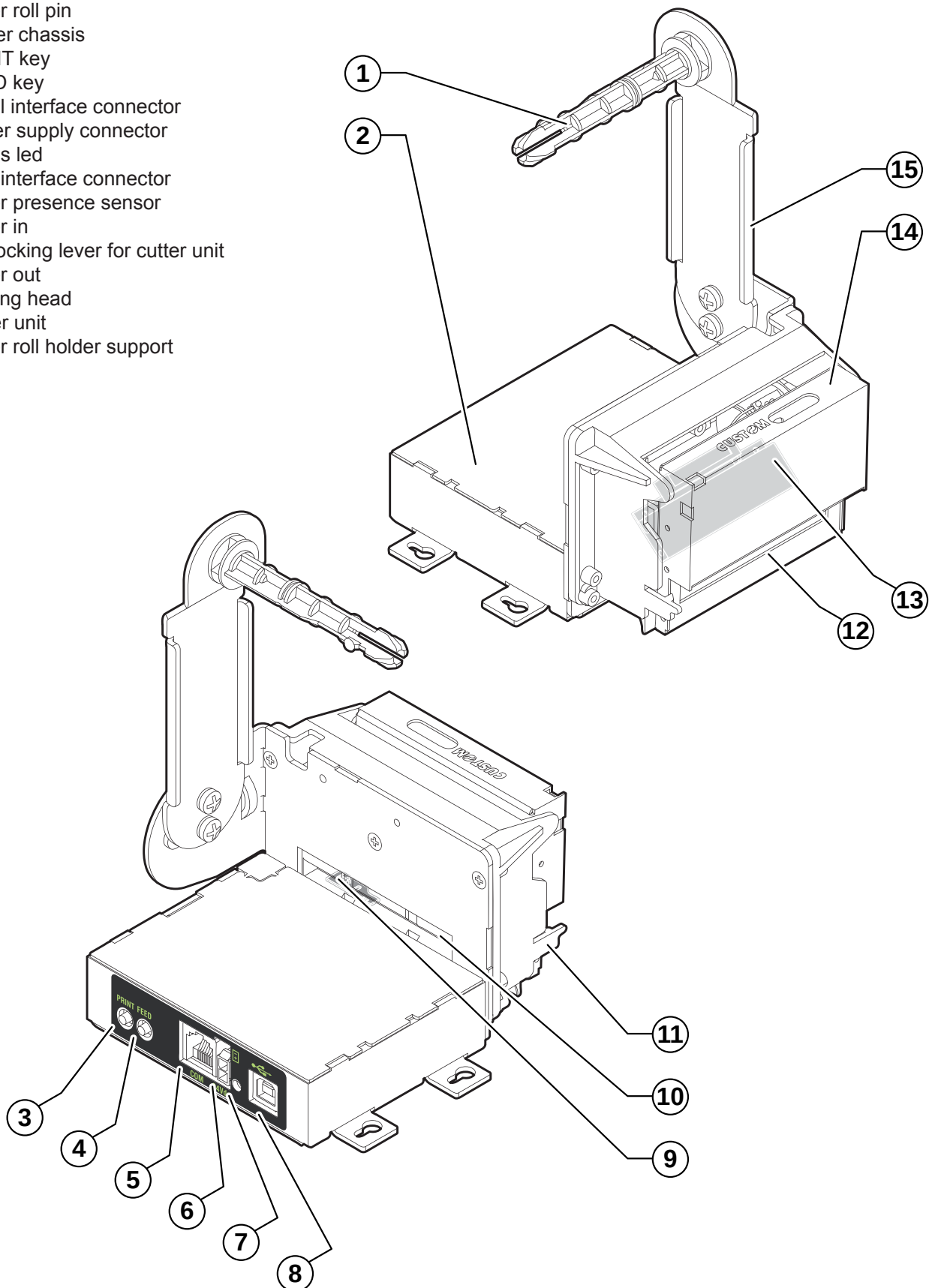
1. Installation instructions
2. Power supply cable (2 ways)
3. Paper roll
4. Fastening screws for paper roll holder support
5. Printer + paper roll holder support
6. Protection packing shell
7. Box



- Open the printer packaging
- Take out the paper roll.
- Take out the installation instructions.
- Take out the power supply cable.
- Lift the protection packing shell and take out the printer.
- Keep the box packing materials in the event the printer must be transported/shipped in the future

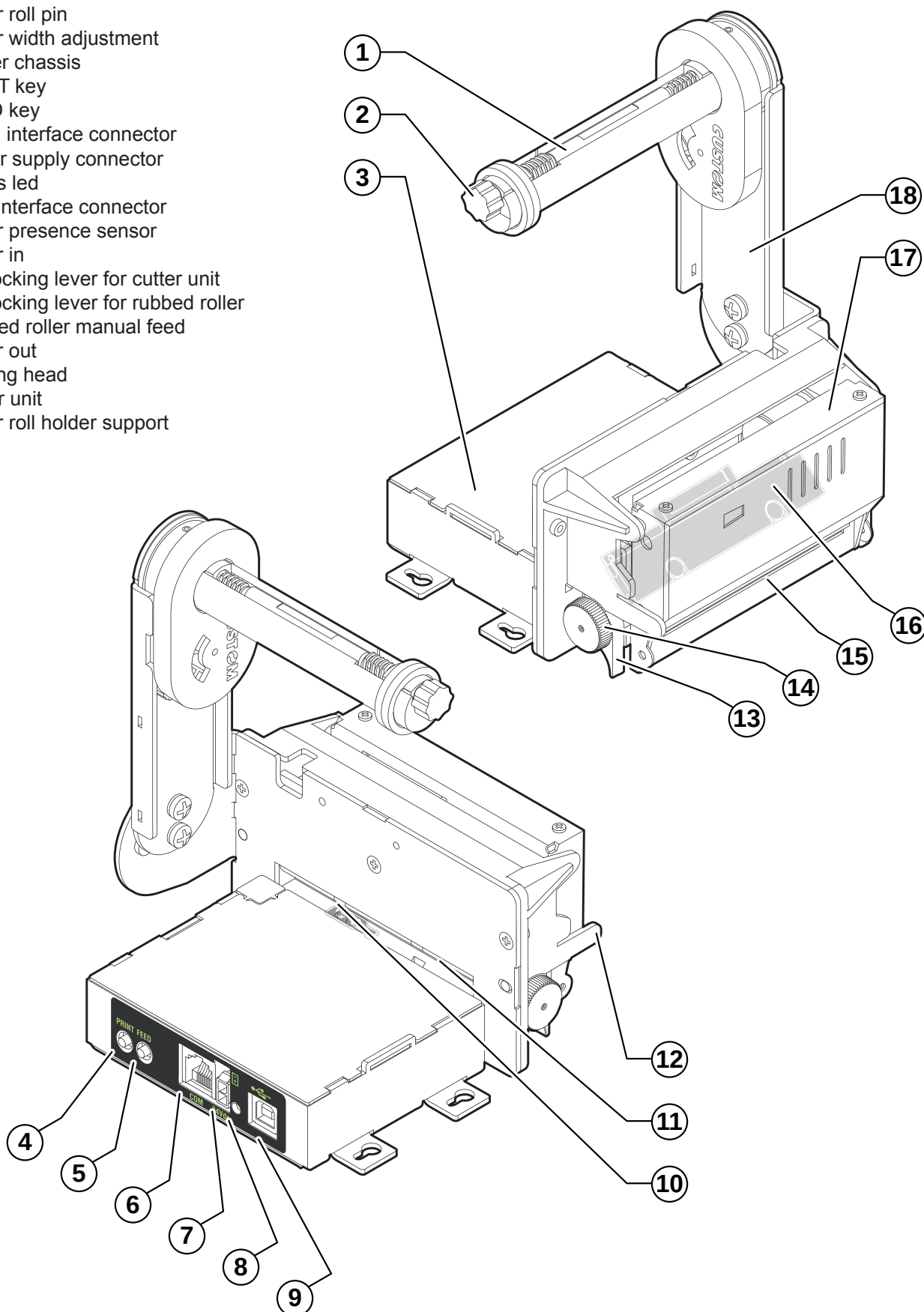


1. Paper roll pin
2. Printer chassis
3. PRINT key
4. FEED key
5. Serial interface connector
6. Power supply connector
7. Status led
8. USB interface connector
9. Paper presence sensor
10. Paper in
11. Unblocking lever for cutter unit
12. Paper out
13. Printing head
14. Cutter unit
15. Paper roll holder support



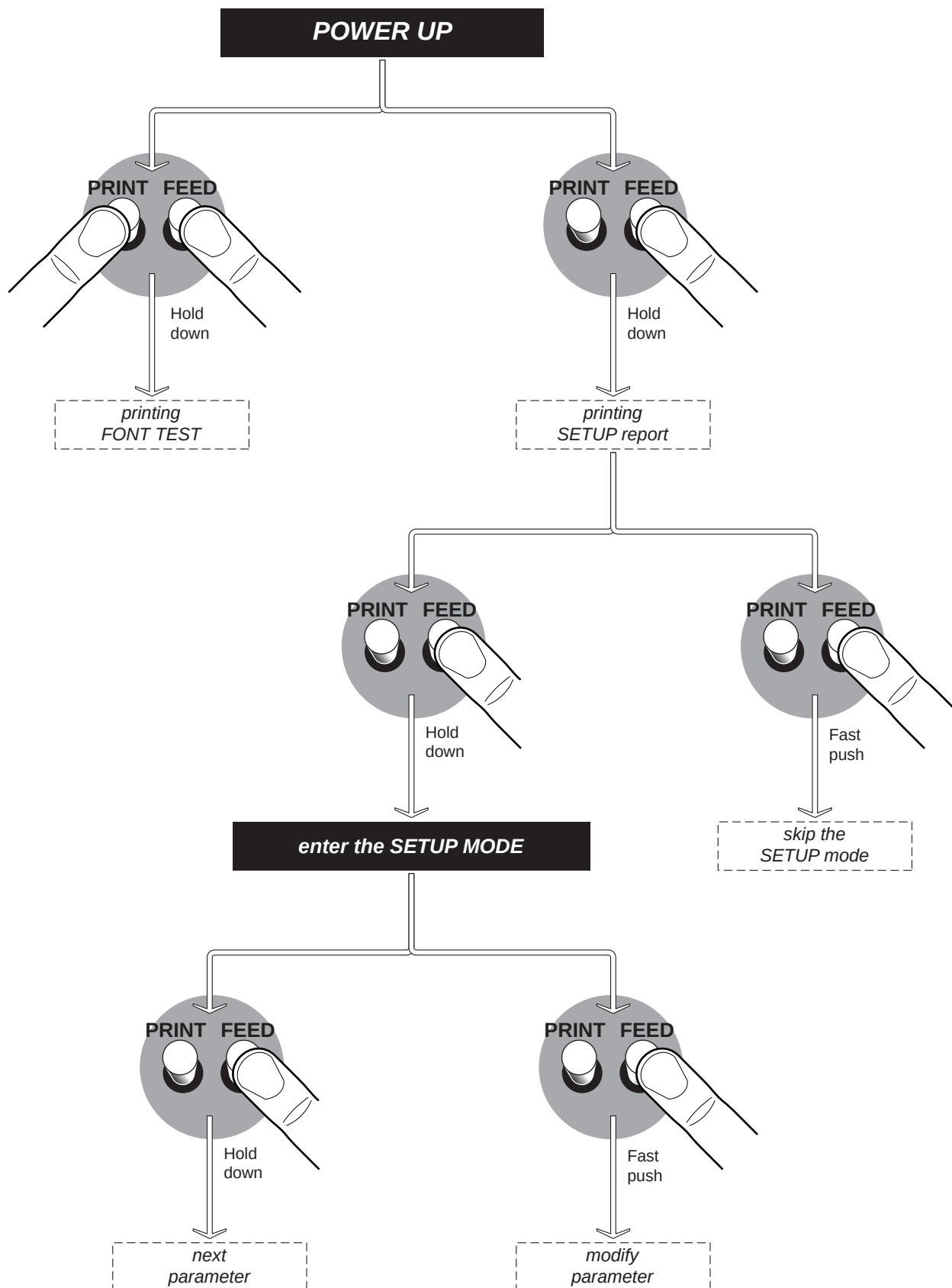
TL80

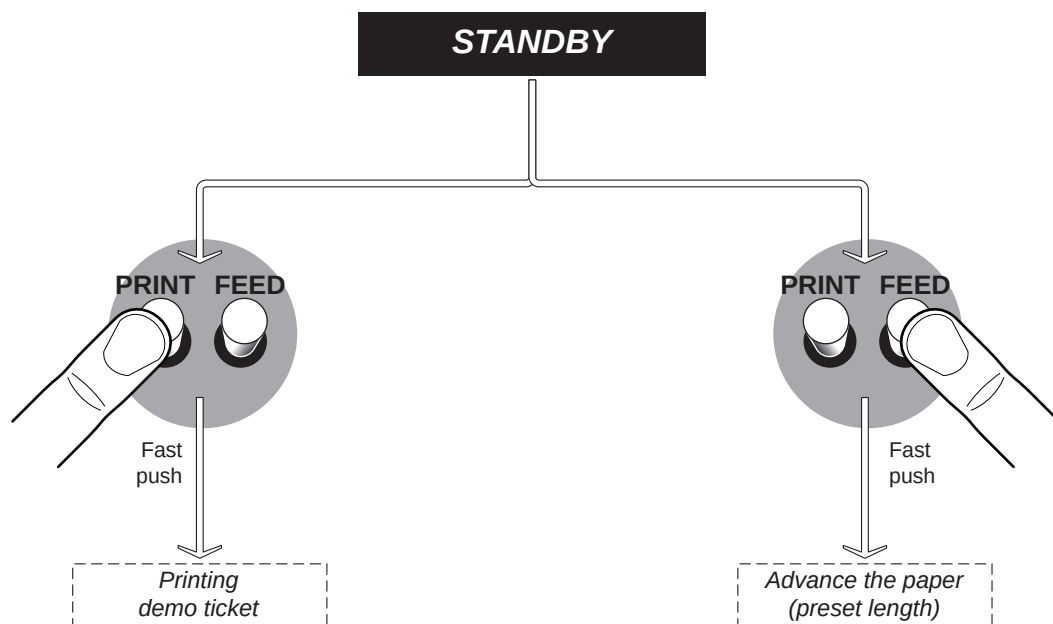
1. Paper roll pin
2. Paper width adjustment
3. Printer chassis
4. PRINT key
5. FEED key
6. Serial interface connector
7. Power supply connector
8. Status led
9. USB interface connector
10. Paper presence sensor
11. Paper in
12. Unblocking lever for cutter unit
13. Unblocking lever for rubbed roller
14. Rubbed roller manual feed
15. Paper out
16. Printing head
17. Cutter unit
18. Paper roll holder support



2.3 Key functions

The following figures show the functions of printer's keys according to the operating condition of the device.





2. DESCRIPTION

2.4 Status led flashes

The Status led indicates hardware status of device. Given in the table below are the various led signals and the corresponding printer status.

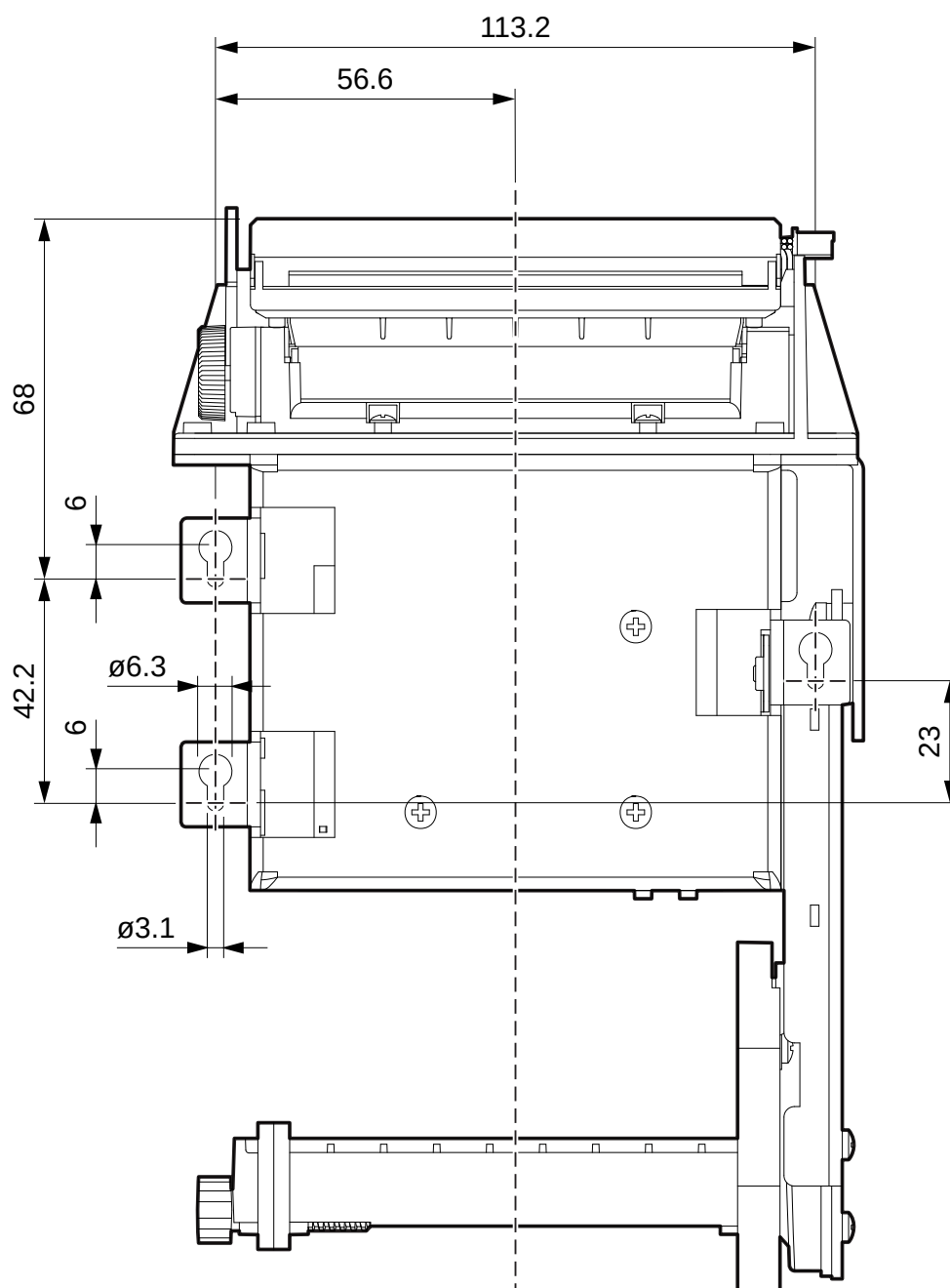
STATUS LED		DESCRIPTION	
-		OFF	PRINTER OFF
GREEN		ON	PRINTER ON : NO ERROR
GREEN RECOVERABLE ERROR		1 x	RECEIVING DATA
		2 x	PRINT HEAD OVER TEMPERATURE
		3 x	PAPER END
		4 x	POWER SUPPLY VOLTAGE INCORRECT
		5 x	RECEIPT ERRORS (PARITY, FRAME ERROR, OVERRUN ERROR)
		6 x	COMMAND NOT RECOGNIZED
		7 x	COMMAND RECEIPT TIME OUT
GREEN UNRECOVERABLE ERROR		11 x	CUTTER ERROR

3 INSTALLATION

3.1 Fastening

TL80

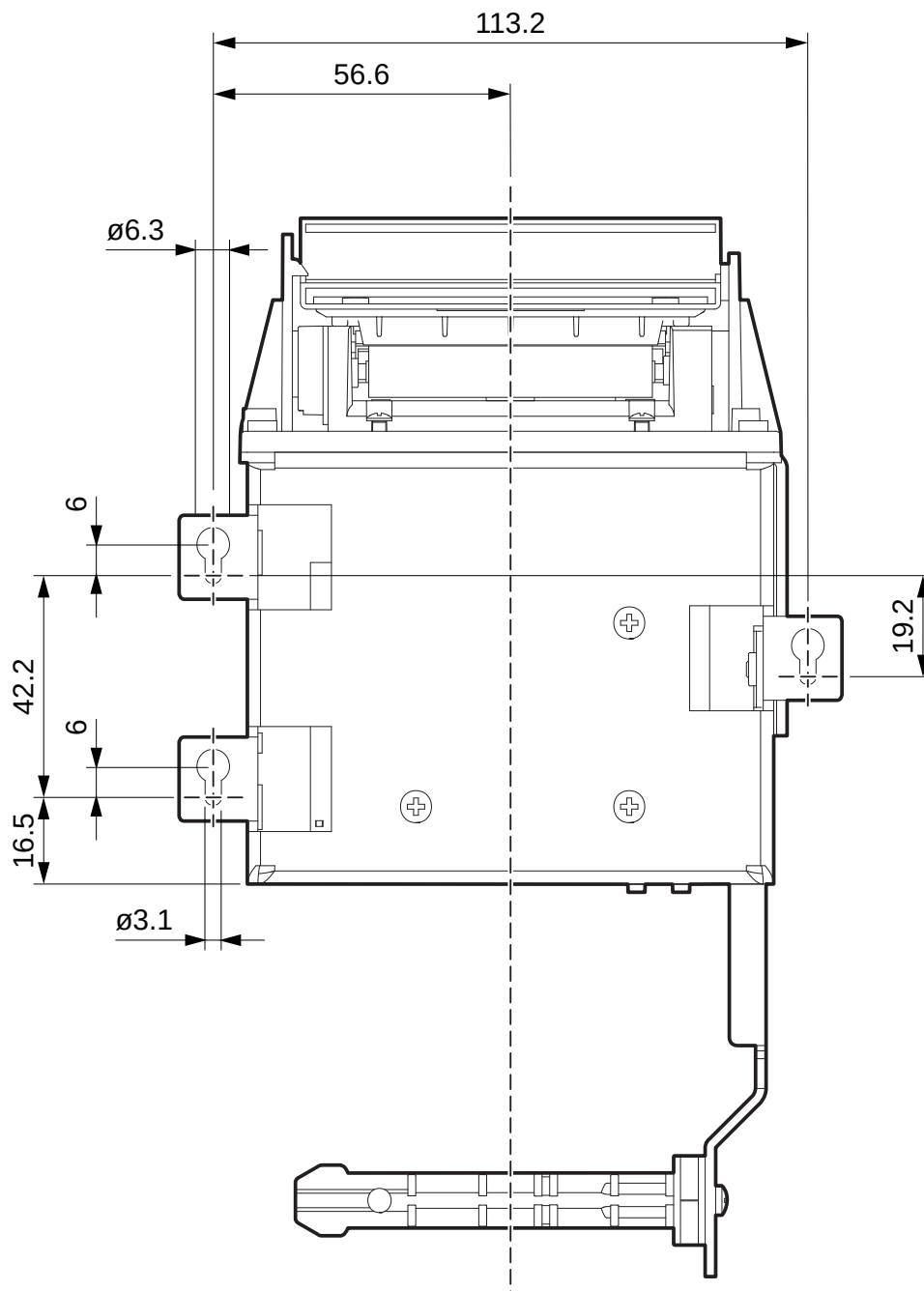
The printer is provided with three fixing holes on the bottom of device (see following figure). To fasten the printer on a panel, use three M3 screws



2. DESCRIPTION

TL60

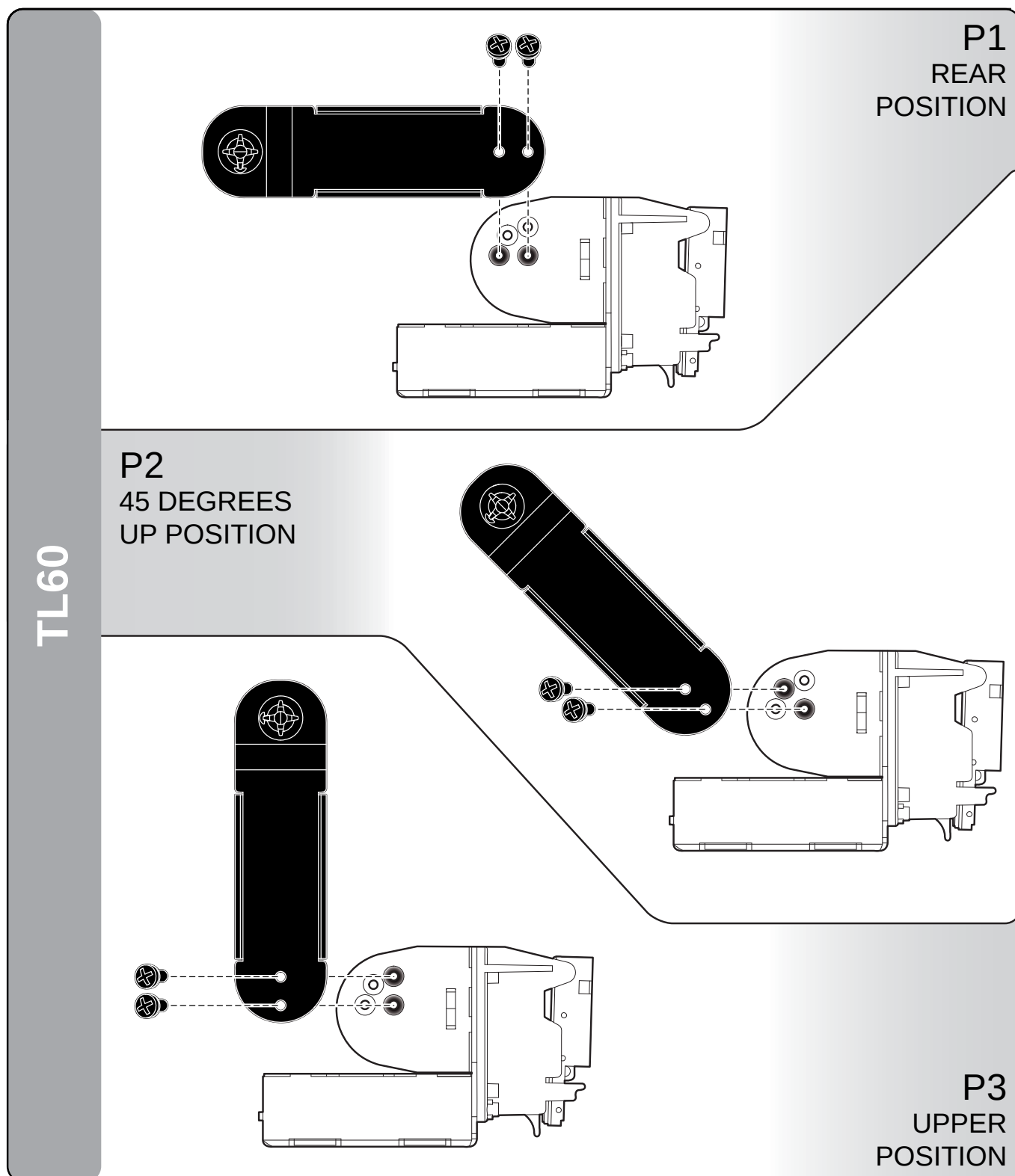
The printer is provided with three fixing holes on the bottom of device (see following figure). To fasten the printer on a panel, use three M3 screws

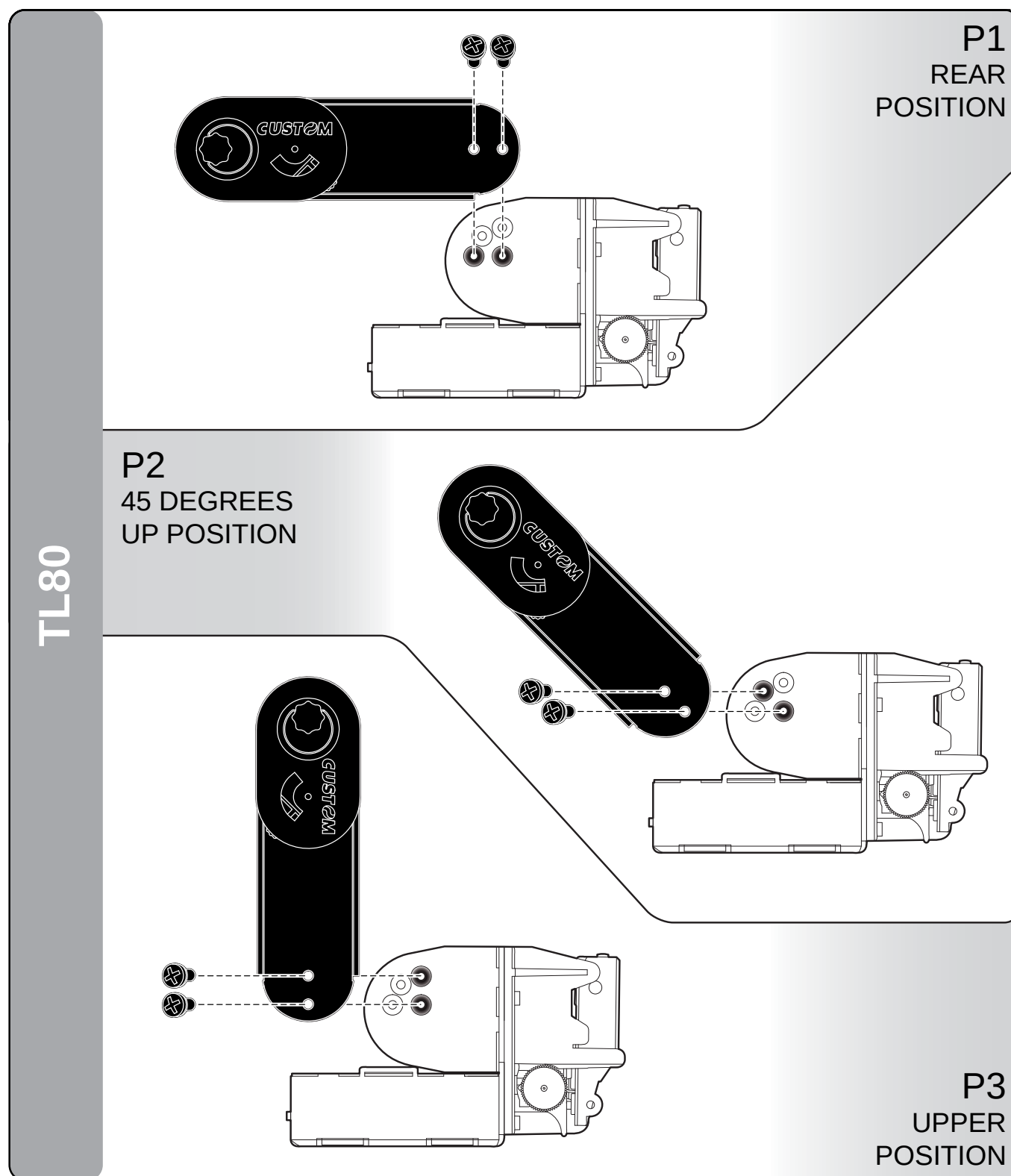


3.2 Positioning paper roll holder support

The paper roll holder support positioning isn't fixed but adjustable on 3 different positions: rear **P1**, 45 degrees up **P2** and upper **P3** (see figure). To fastening the paper roll holder support proceed as follow:

1. Move the paper roll holder support until the two holes coincide with the two holes on the printer body.
2. Fasten the paper roll holder support by the two M4x6 fastening screws supplied.



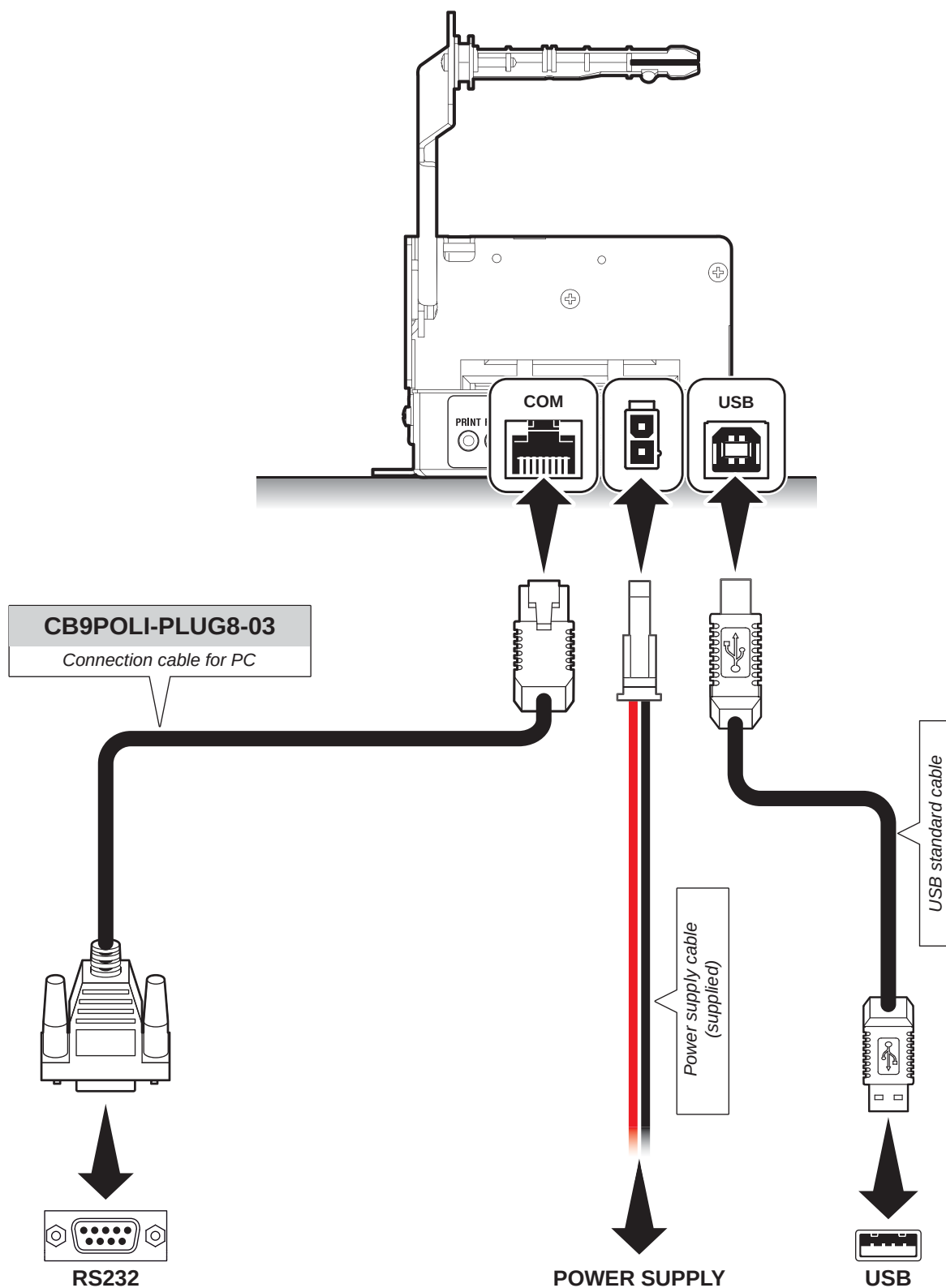


WARNING

Before fastening the paper roll holder support check the cable paths are correct. Incorrect positions of the cables may cause damage.

3.3 Connections

The following figures show the possible connections for device.



ATTENTION:

In some using conditions, we recommend the installation of a ferrite core on the power supply cable.

NOTE: If serial and USB connectors are inserted, communication port is USB

3.4 Pinout



POWER SUPPLY
Male Molex connector series 5569 vertical (no. 39-30-1020)

J14	1	+24 Vdc
	2	GND

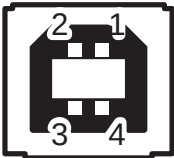
ATTENTION:
Respect power supply polarity.

Note: Power supply cable
The following figure shows the connector pinout of the power supply cable for the device:

Power supply cable

Female Molex connector series 5557 (n.39-01-3022)

PIN	Cable color	Signal
1	Red	+24V
2	Black	GND



USB INTERFACE
Connettore USB type B femmina

J1	1	USB0-VBUS	(in)
	2	D0 -	(in/out)
	3	D0 +	(in/out)
	4	GND	
	SH1	SHIELD	
	SH2	SHIELD	



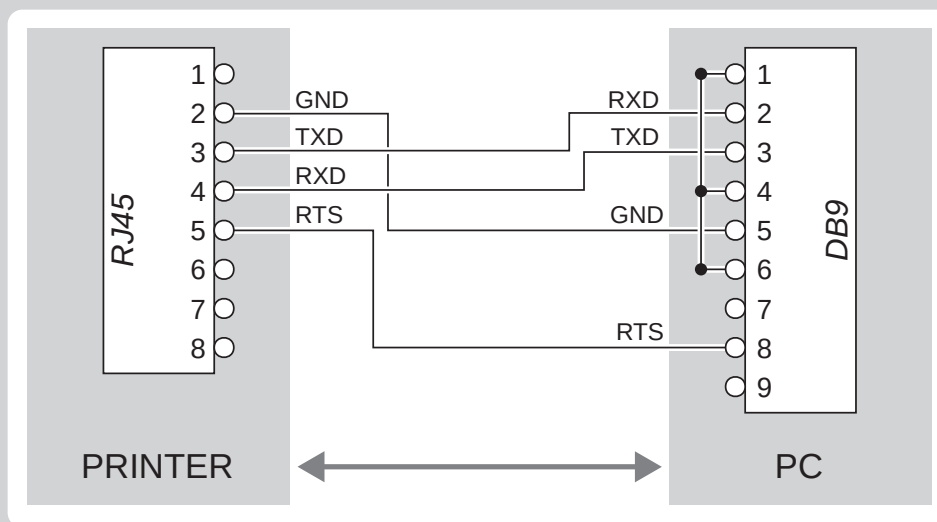
SERIAL INTERFACE

RJ45 female connector

J15	1	n.c.		
	2	GND		
	3	TX	(out)	During transmission, takes the values "0" and "1" depending on data
	4	RX	(in)	During reception, takes the values "0" and "1" depending on data
	5	RTS	(out)	When "1", printer is ready to receive data
	6	n.c.		
	7	n.c.		
	8	n.c.		

Note: TL60, TL80 > PC connection

The following pictures show an example of connections between the printer and a personal computer using a 8 pin male RJ45 serial connectors and a 9 pin female serial connectors:



3. INSTALLATION

3.5 Driver

The drivers are available for the following operating system:

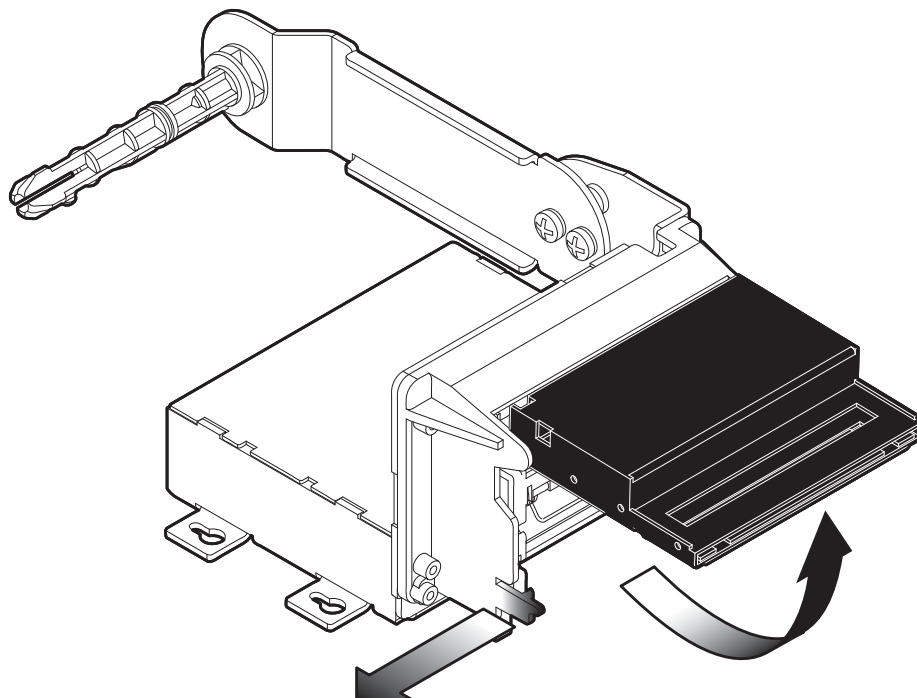
OPERATING SYSTEM	INSTALLATION PROCEDURE
Windows XP	From the START menu, press Enter and key-in the path where the SW was saved on your PC, then click OK. Follow the instructions that appear on the screen to install the driver.
Windows VISTA (32/64bit)	
Windows 7 (32/64bit)	

All drivers can be found in the DOWNLOAD section of the web site www.custom.biz.

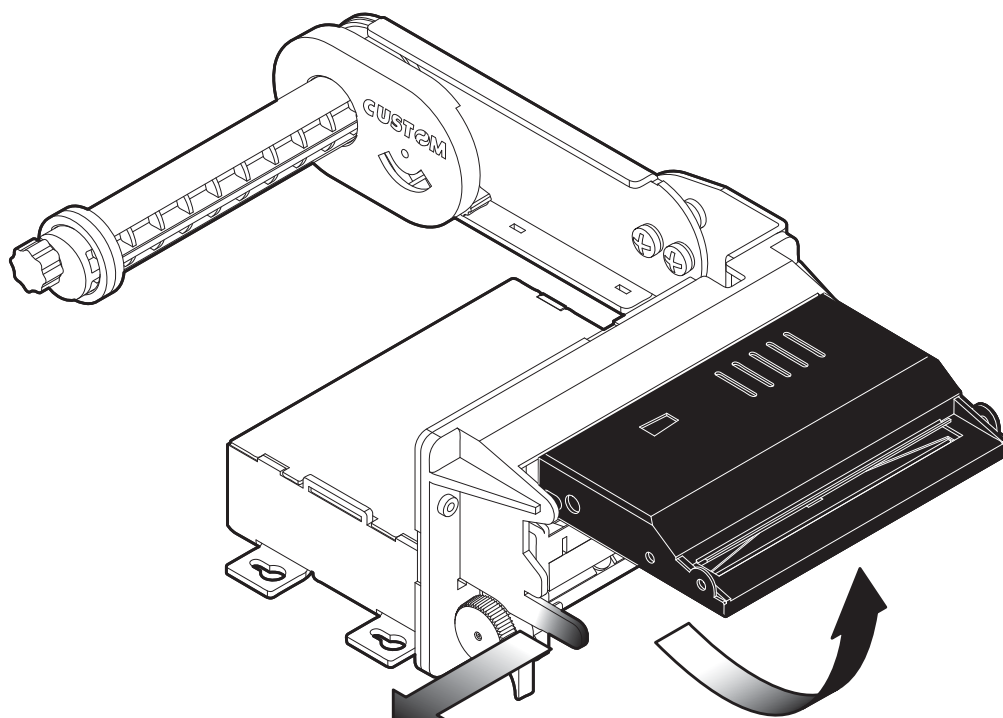
4 OPERATION

4.1 Open the printer

TL60



TL80

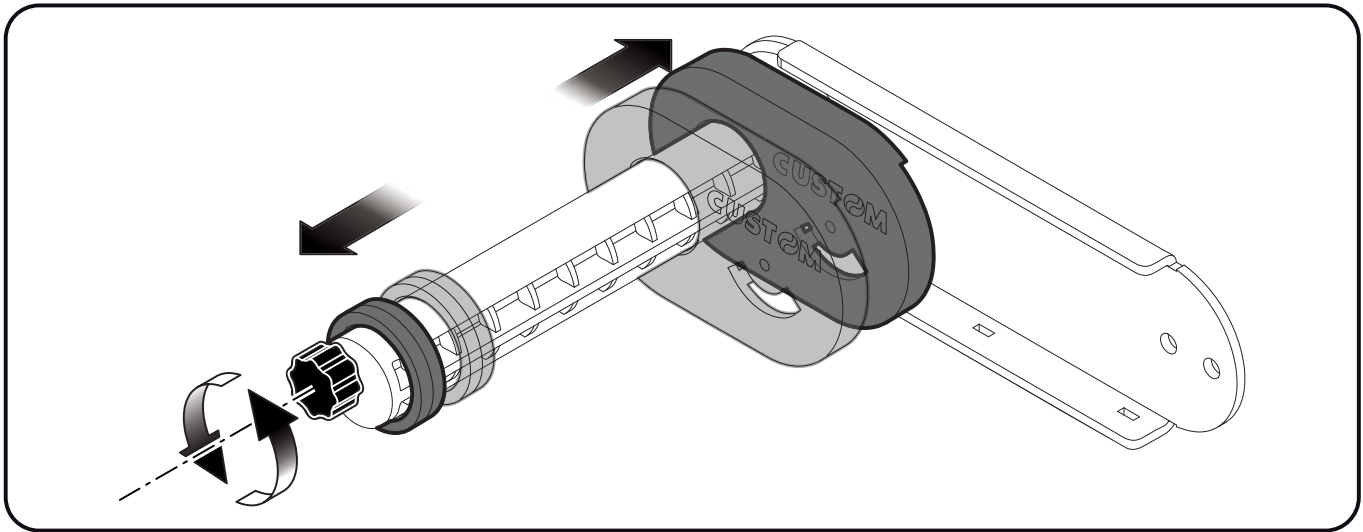
**NOTE:**

After each maintenance operation is recommended to check and remove possible scraps of paper.

4. OPERATION

4.2 Adjustment for paper roll holder support (TL80 only)

With TL80 printer it is possible to use paper roll with paper width from 52mm to 80mm. To adjust the housing width for paper roll, rotate the knob as shown.



4.3 Replace paper roll

To replace the paper roll proceed as follow:

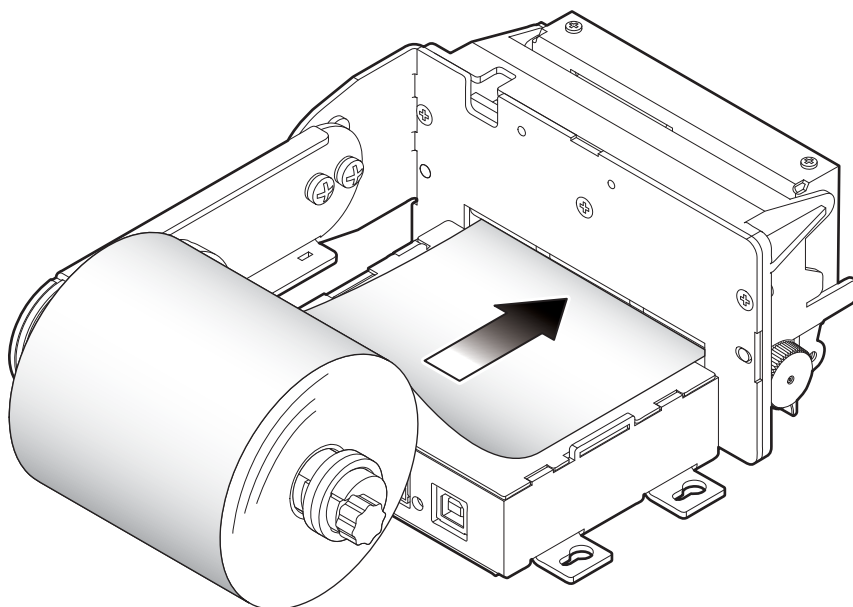
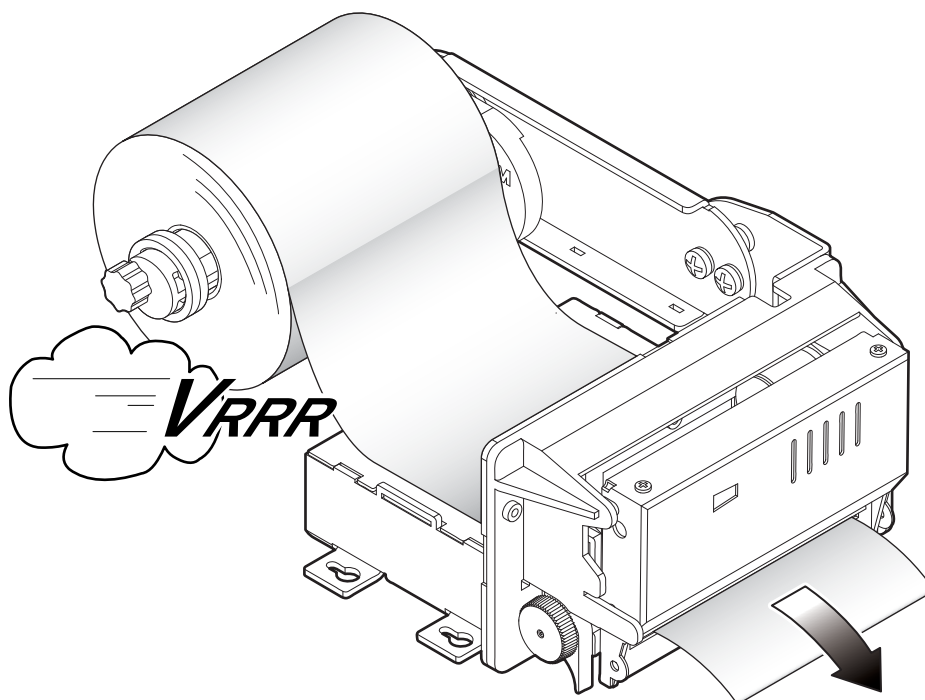
1. Put the paper roll on the paper roll holder support.
2. Insert the paper into the paper infeed opening so that it unrolls in the direction shown in figure.
3. Wait for paper to load automatically.

WARNING

Before inserting the paper, make sure the cut is straight.

NOTE

The paper loading is the same for TL60 and TL80 models.

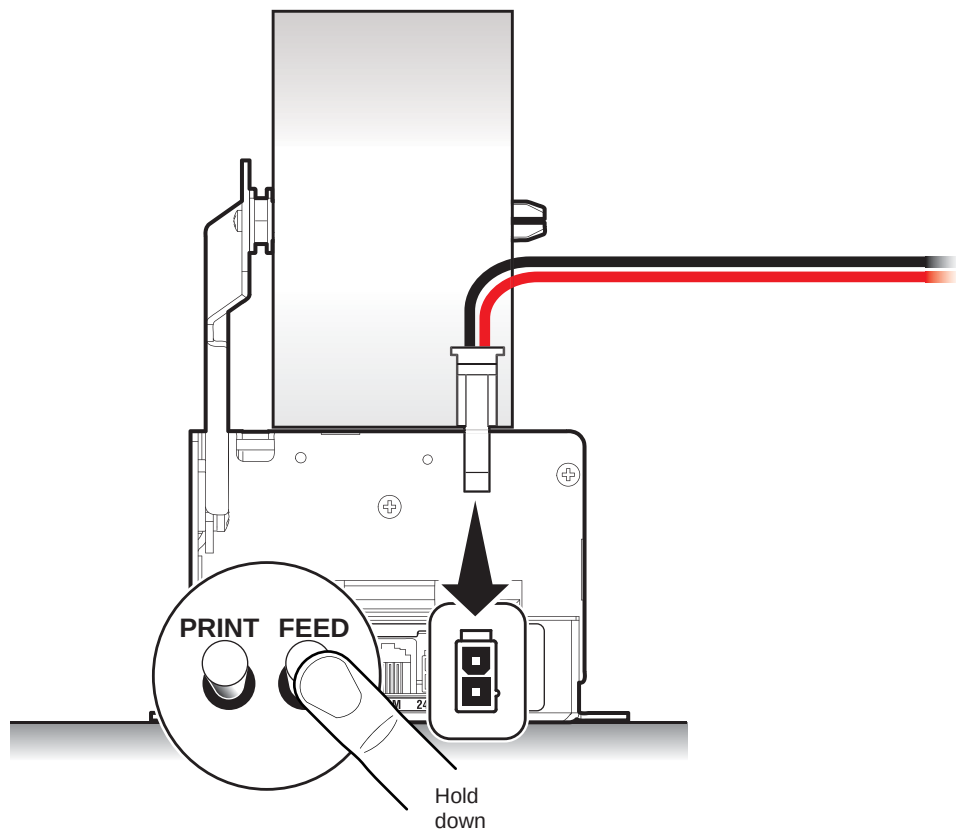
1**2**

5 CONFIGURATION

5.1 Configuration mode

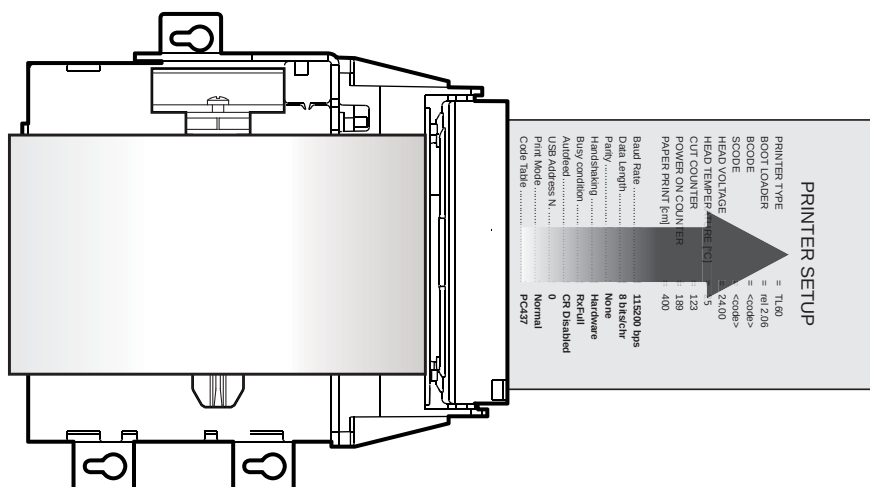
To enter the configuration mode and print a SETUP report with the operating parameters of the printer, proceed as follows.

1



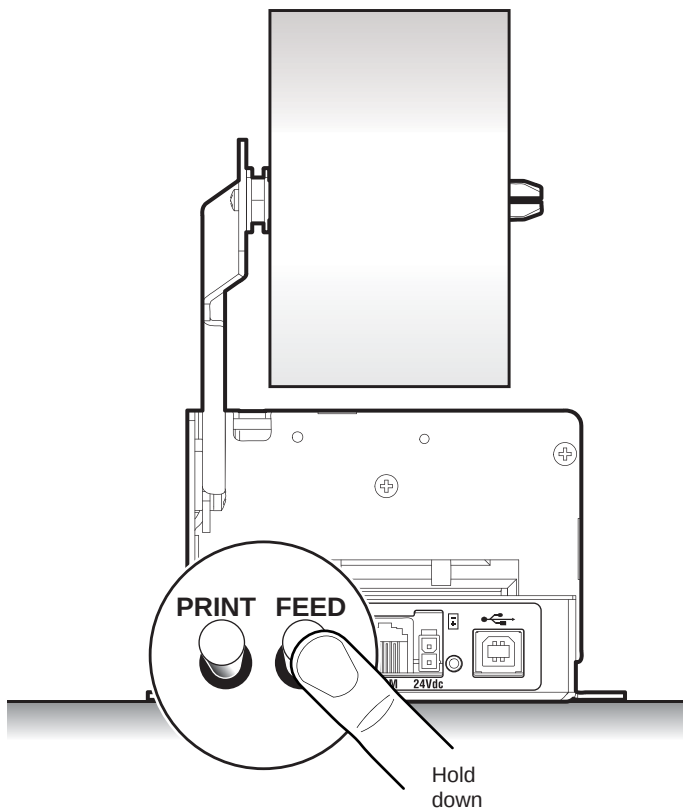
During power-up, hold down the FEED key while the wiring is plugged into the power supply connector of the printer

2



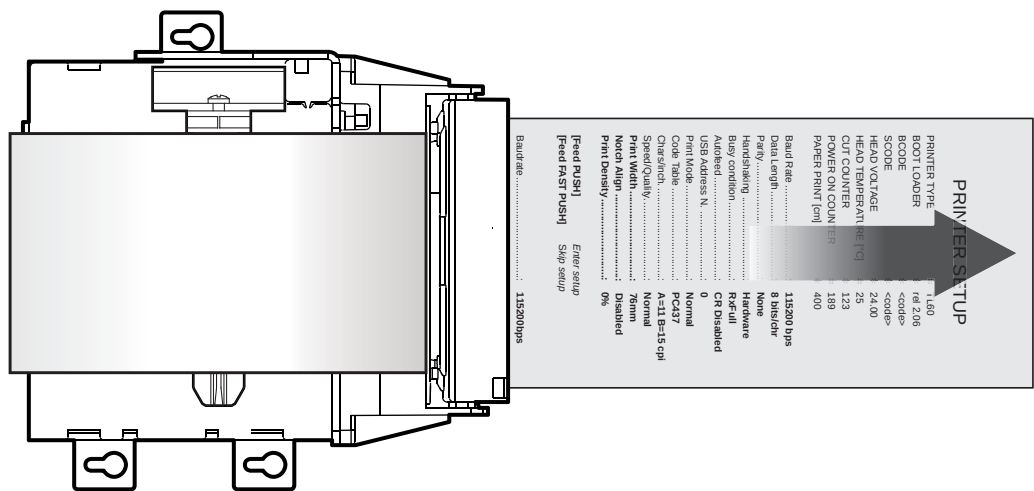
The device prints a setup report

3



Press the FEED key to enter the configuration mode

4



Proceed with the configuration by using the keys according to the functions printed on paper (see par.2.3).
For description and values of setup parameters, see the following paragraphs

NOTE:
During power-up, if the FEED key is held down, the printer enters the auto-test routine and prints out the setup report. The printer will remain in standby in Hexadecimal dump mode (see following paragraphs) until another key is pressed or characters are received through the printer communication port. When the FEED key is pressed, the printer enters parameter configuration. When the FEED key is pressed shortly, the printer exits setup and terminates the Hexadecimal dump function.

5.2 Setup report

The following figure shows an example of the setup report of the printer. The shown values for parameters are sample values; for the list and the description of printer parameters see the following paragraphs.

PRINTER NAME and FIRMWARE RELEASE (see chapter 11)	<Printer model> rel.1.00
PRINTER STATUS (see paragraph 5.3)	PRINTER SETUP PRINTER TYPE = TL80 BOOT LOADER = rel. 2.06 BCODE = <code> SCODE = <code> HEAD VOLTAGE [V] = 23.57 HEAD TEMP. [°C] = 24 CUT COUNTER = 0 POWERON COUNTER = 100 PAPER PRINT [cm] = 160
PRINTER PARAMETERS (see paragraph 5.4)	Baud Rate: 19200 bps Data Length.....: 8 bits/chr Parity: None Handshaking: XON/XOFF Busy Condition: RxFull Autofeed: CR Disabled USB Address N: 0 Print Mode: Normal Code Table: PC437 Chars / inch: A=11 B=15 cpi Speed / Quality.....: Normal Print Width.....: 76 mm Notch Align.: Enabled Notch ThresH: 1.25V Notch Dist.mm.....: 00.0 Print Density.....: 0 %
KEY FUNCTIONS (see paragraph 2.3)	[Feed PUSH] enter setup [Feed FAST PUSH] skip setup

5. CONFIGURATION

5.3 Printer status

Printer operating status is indicated in the configuration print-out in which, next to the name of the components displayed, the following information is given:

HEAD VOLTAGE	<i>is given the voltage of the head</i>
HEAD TEMPERATURE	<i>is given the temperature of the head</i>
CUT COUNTER	<i>is given the number of cuts made</i>
POWERON COUNTER	<i>is given the number of power-up made</i>
PAPER PRINT	<i>is given the number of centimetres of paper printed</i>

5.4 Printer parameters

This printer allows the configuration of the parameters listed in the following table.

The parameters marked with the symbol ^D are the default values.

Settings remain active even after the printer has been turned off and they are stored in non-volatile memory.

BAUD RATE	<i>Communication speed of the serial interface:</i>		
	115200	19200 ^D	2400
	57600	9600	1200
	38400	4800	
	NOTE: Parameter valid only with serial interface.		
DATA LENGTH	<i>Number of bit used for characters encoding:</i>		
	7 bits/car		
	8 bits/car ^D		
	NOTE: Parameter valid only with serial interface.		
PARITY	<i>Bit for the parity control of the serial interface:</i>		
	None ^D = parity bit omitted		
	Even = even value for parity bit		
	Odd = odd value for parity bit		
	NOTE: Parameter valid only with serial interface.		
HANDSHAKING	<i>Handshaking:</i>		
	XON/XOFF ^D = software handshaking		
	Hardware = hardware handshaking (CTS/RTS)		
	NOTE: Parameter valid only with serial interface.		
	NOTE: When the receive buffer is full, if handshaking is set to XON/XOFF, the printer sends the XOFF (\$13) on the serial port. When the receive buffer has cleared once again, if handshaking is set to XON/XOFF, the printer sends the XON (\$11) on the serial port.		
BUSY CONDITION	<i>Activation mode for Busy signal:</i>		
	OffLine/ RXFull = Busy signal is activated when the printer is both in OffLine status and the buffer is full		
	RXFull ^D = Busy signal is activated when the buffer is full		
	NOTE: Parameter valid only with serial interface.		
AUTOFEED	<i>Setting up the carriage return character:</i>		
	CR disabled ^D = Carriage Return disabled		
	CR enabled = Carriage Return enabled		
USB ADDRESS N	<i>Numerical address code for the univocal identification of the USB device (in case of more than a USB device connected with the same PC):</i>		
	0 ^D	4	8
	1	5	9
	2	6	
	3	7	
PRINT MODE	<i>Printing mode:</i>		
	Normal ^D = enables printing in normal writing way		
	Reverse = enables printing rotated 180 degrees		

5. CONFIGURATION

CODE TABLE	Table of characters (character code):		
	PC437 ^D	PC858	
	PC850	PC866	
	PC860	VISCII	
	PC863	U.D.P.	
	PC865		
	NOTE: This parameter is not printed in the setup report of TL60 AND TL80 with simplified chinese font.		
CHARS / INCH	Font selection: A = 11 cpi, B = 15 cpi ^D A = 15 cpi, B = 20 cpi		
SPEED / QUALITY	Setting of printing speed and printing quality: Normal ^D Low		
PRINT WIDTH	<u>TL60 models</u> 52 mm 56mm ^D	<u>TL80 models</u> 52 mm 68 mm 56 mm 72 mm 60 mm 76 mm ^D 64 mm 80 mm	
NOTCH ALIGNMENT	Alignment management: Disabled ^D = the notch alignment is not performed Enabled = the notch alignment is performed		
NOTCH THRESHOLD	Threshold value for the recognition of the presence of notch by the notch sensor: 0.75V 1.50V 2.25V 1.00V 1.75V 2.75V 1.25V ^D 2.00V 2.50V		
	NOTE: If the "Notch Alignment" parameter is disabled, this parameter is not printed.		
NOTCH DISTANCE	"Notch Distance" is the minimum distance (in mm) between the upper edge of ticket and the notch. The numeric value of the distance is made up with the following three parameters for the setting of three digits (two for the integer part of the number and one for the decimal part):		
	Setting the digit for tens:		
NOTCH DISTANCE [mm x 10]	0 ^D 1		
	Setting the digit for units:		
NOTCH DISTANCE [mm x 1]	0 ^D 1 2		
	Setting the digit for decimals:		
NOTCH DISTANCE [mm x .1]	0 ^D	4	8
	1	5	9
	2	6	
	3	7	

NOTE: For example, to set the notch distance to 10 mm, modify the parameters as follows:

Notch Distance [mm x 10] = 1

Notch Distance [mm x 1] = 0

Notch Distance [mm x .1] = 0

NOTE: If the "Notch Alignment" parameter is disabled, the parameters for the "Notch Distance" are not printed.

PRINT DENSITY

Adjusting the printing density:

-50% -12% +25%

-37% 0^D +37%

-25% +12% +50%

5.5 Hexadecimal dump

This function is used to diagnose the characters received through the communication port; the characters are printed out both as hexadecimal codes and ASCII codes.

Once the self-test routine has finished, the printer enters Hexadecimal Dump mode. The printer remains in standby until a key is pressed or characters are received through the communication port. For every 8 characters received, the hexadecimal and corresponding ASCII codes are printed out (if the characters are underlined, the receive buffer is full). Shown below is an example of a Hexadecimal Dump:

48	65	78	61	64	65	63	69	Hexadecima
6C	20	64	75	6D	70	20	66	I dump fun
63	74	69	6F	6E	20	30	31	ction 0123
34	35	36	37	38	39	61	62	456789abcd
65	66	67	68	69	6A	6B	6C	efghijklmn
6F	70	71	72	73	74	75	76	opqrstuvwxyz
79	7A							yz

6 MAINTENANCE

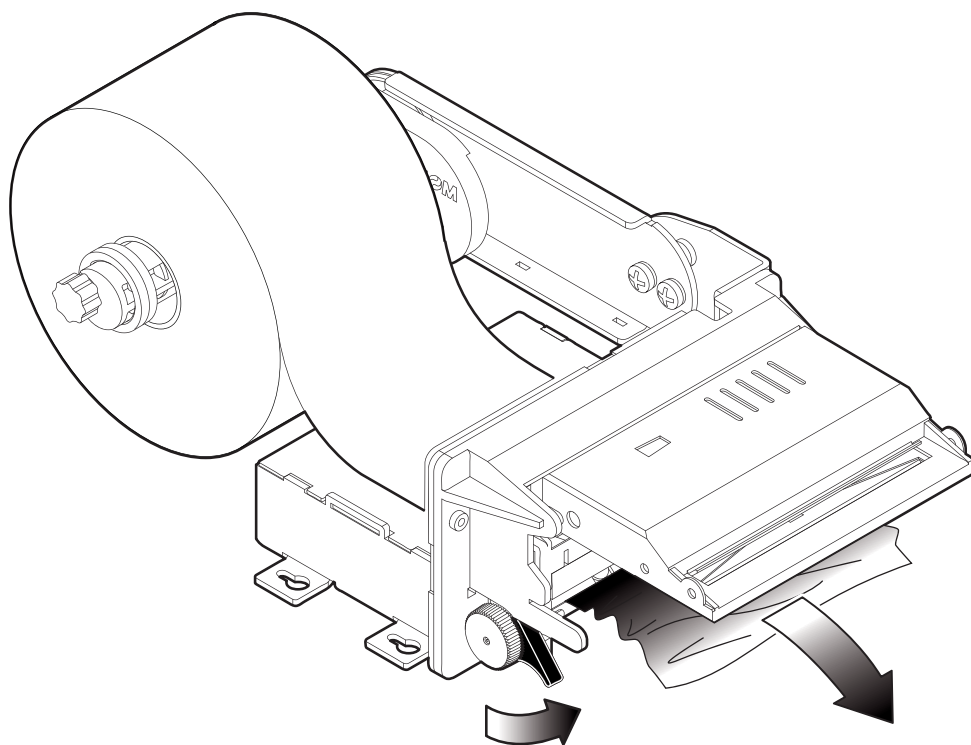
6.1 Paper jam

In case of paper jam in a TL80 printer proceed as follows:

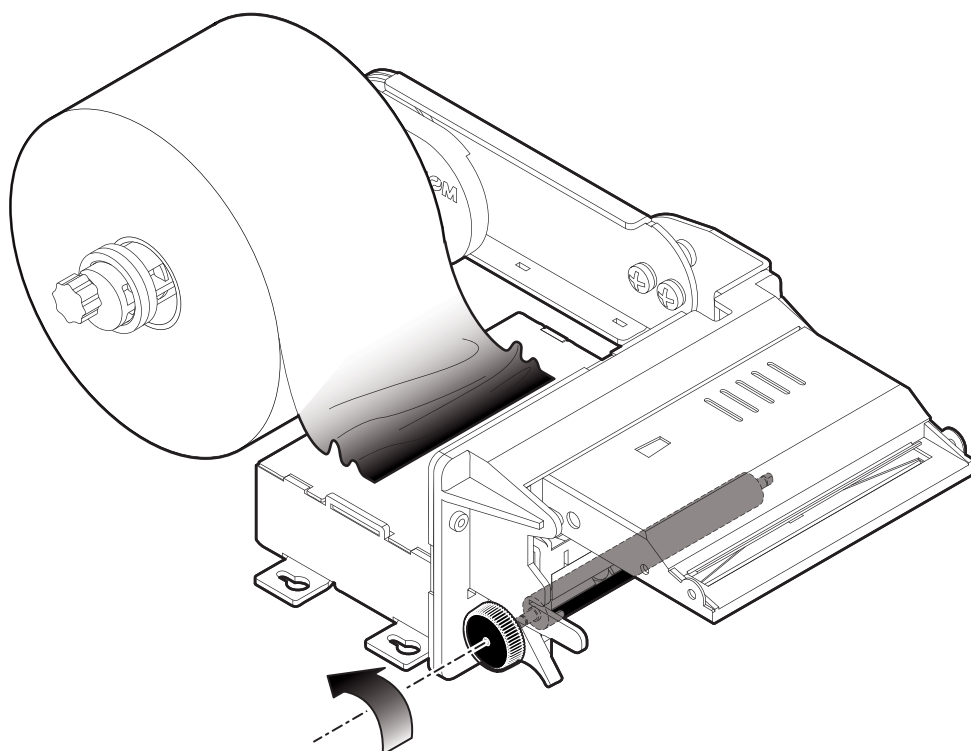
- Open the printer (see previous paragraphs).
- Lift the unblocking lever for the rubbed roller and remove possible scraps of paper from the front side of printer.
- Rotate the rubbed roller clockwise to eject the paper.

TL80

1



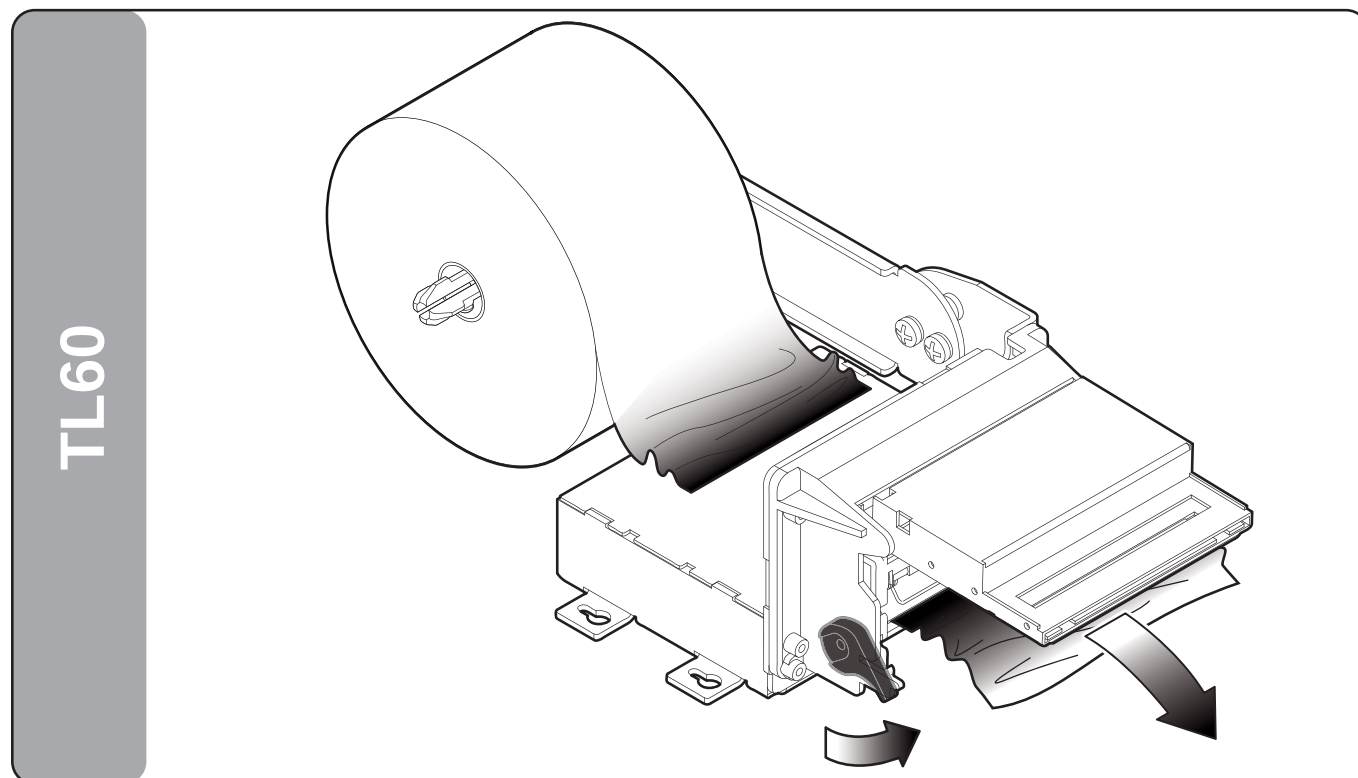
2



6. MAINTENANCE

In case of paper jam in a TL60 printer proceed as follows:

- Open the printer (see previous paragraphs).
- Lift the unblocking lever for the rubbed roller and remove possible scraps of paper from the front side and from the paper infeed opening.



WARNING:

It's not possible to lift the blocking lever for rubbed roller without lifting the cutter unit

6.2 Planning of cleaning operations

The regular cleaning of the device keeps the print quality and extends its life. The following table shows the recommended planning for the cleaning operations.

EVERY ROLL CHANGE	
Rollers	Use isopropyl alcohol
EVERY 5 ROLL CHANGES *	
Paper path	Use compressed air or tweezers
EVERY 6 MONTHS OR AS NEEDED *	
Printer case	Use compressed air or a soft cloth

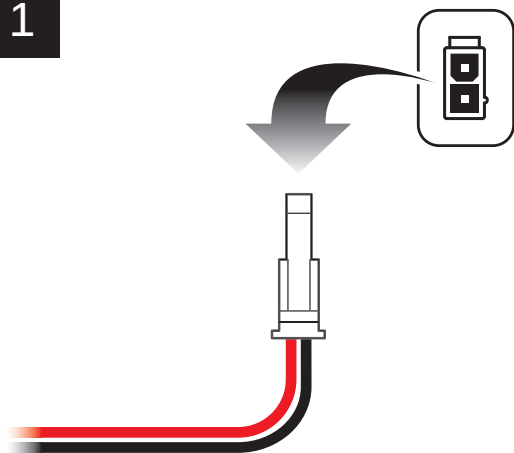
* If you use the device in dusty environments, you must reduce the intervals between the cleaning operations.

For specific procedures, see the following pages.

6.3 Cleaning

ROLLERS

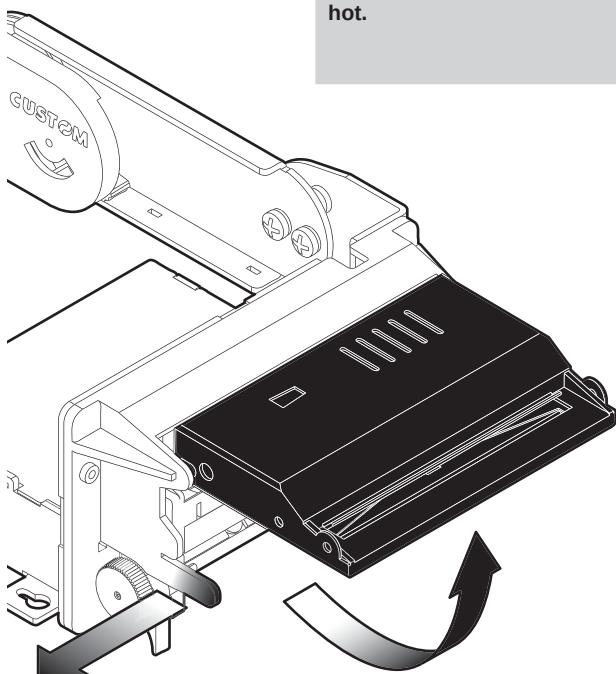
1



Disconnect the power supply cable

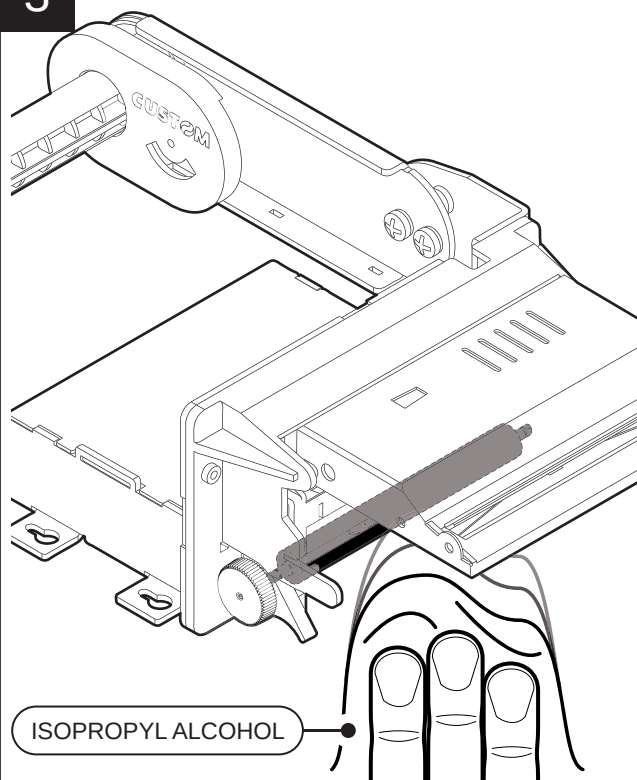
2

ATTENTION:
Do not touch the head heating line with bare hands or metal objects. Do not perform any operation inside the printer immediately after printing because the head and motor tend to become very hot.



Wide the blocking lever for cutter unit and rotate the cutter unit up

3



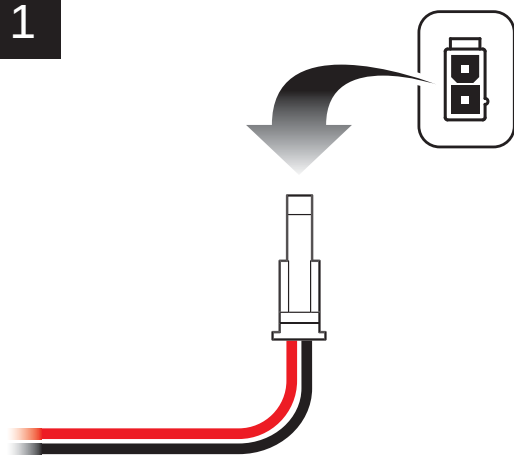
ATTENTION:
Do not use alcohol, solvents, or hard brushes. Do not let water or other liquids get inside the machine.



Clean the dragging roller by using a soft cloth moistened with isopropyl

PAPER PATH

1

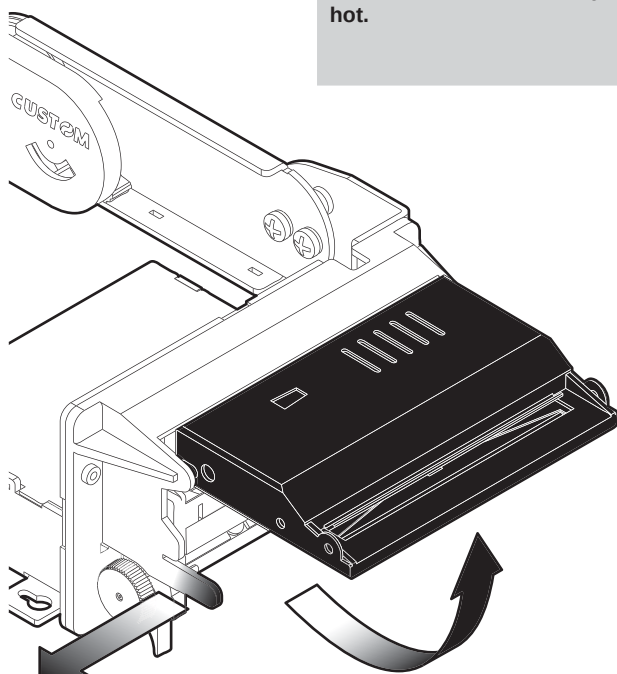


Disconnect the power supply cable

2

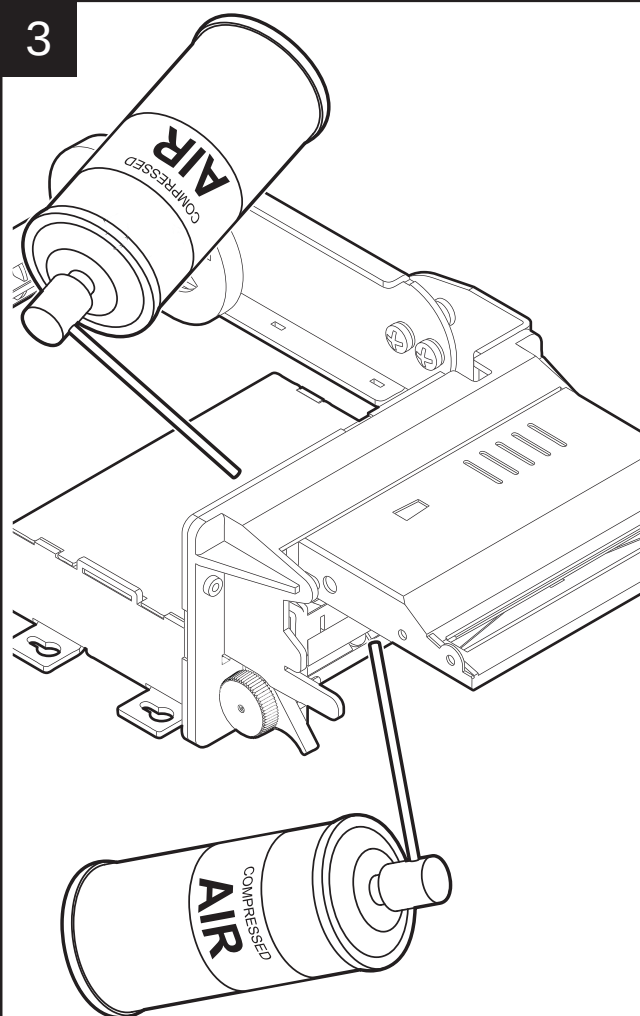
ATTENTION:

Do not touch the head heating line with bare hands or metal objects. Do not perform any operation inside the printer immediately after printing because the head and motor tend to become very hot.



Wide the blocking lever for cutter unit and rotate the cutter unit up

3

**ATTENTION:**

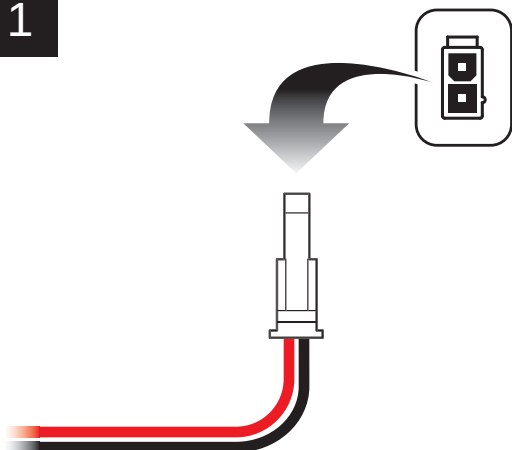
Do not use alcohol, solvents, or hard brushes. Do not let water or other liquids get inside the machine. To remove paper scraps, use tweezers or compressed air.



Carefully clean the paper path by using compressed air. Remove any scraps of paper and the accumulated paper dust on the printing roller and on the area around the sensors

CASE

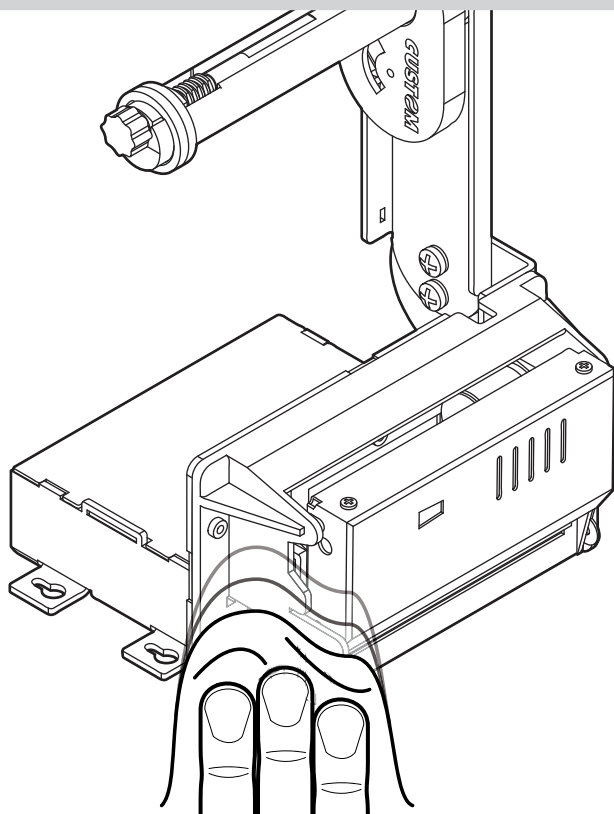
1



Disconnect the
power supply cable

2

ATTENTION:
Do not use alcohol, solvents, or hard brushes. Do
not let water or other liquids get inside the
machine.



To clean the machine,
use pneumatic air or soft cloth

6.4 Upgrade firmware

WARNING: During communication between PC/printer for the firmware update it is strictly forbidden to disconnect the communication cable or to remove the power supply of the devices not to endanger the proper functioning of the printer.

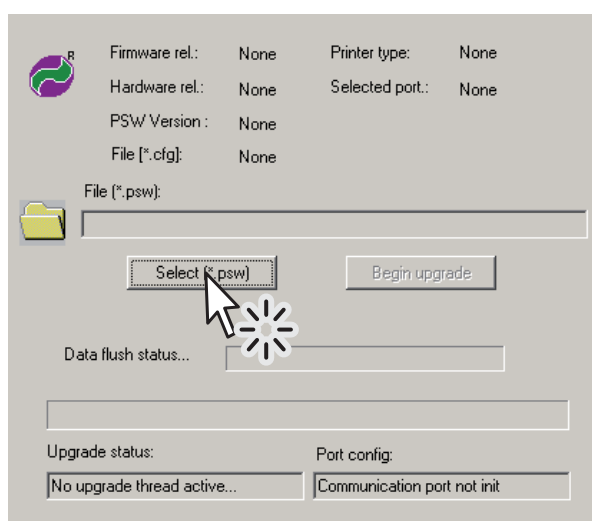
Note: The latest firmware of the printer is available in the download area of the web site www.custom.biz.

Note: Install on the PC used for printer upgrading the UPGCEPRN software available in the download area of the web site www.custom.biz.

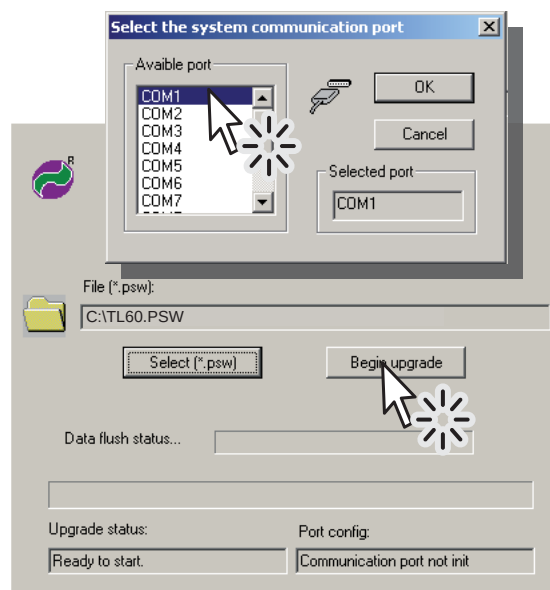
UPDATE VIA SERIAL INTERFACE

Proceed as follows:

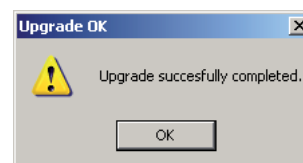
1. Print the SETUP report (see chapter 5).
2. Switch OFF the printer.
3. Connect the printer to the PC using a serial cable (see paragraph 3.3).
4. Switch ON the printer.
5. Start the software UPGCEPRN.
6. Select the update file .PSW location:



7. Select the serial communication port (ex. COM1):



8. Detecting and setting of the parameters necessary for serial communication are performed automatically and then updating begins.
9. After a few minutes a message on the screen warns that the update is completed.



10. Print a new SETUP report to verify the new firmware release (see chapter 5).

UPDATE VIA USB INTERFACE

ATTENTION: Only during the firmware update, the connection between PC and printer must be direct, without the use of wireless HUB.

ATTENTION: Only during the firmware update, do not connect or disconnect other USB devices.

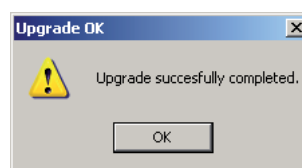
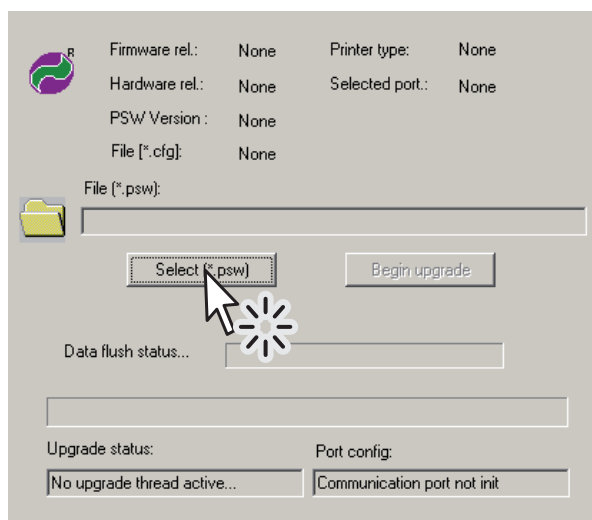
NOTE: For communication via USB you must install on PC the printer driver available in the download area of the web site www.custom.biz.

Proceed as follows:

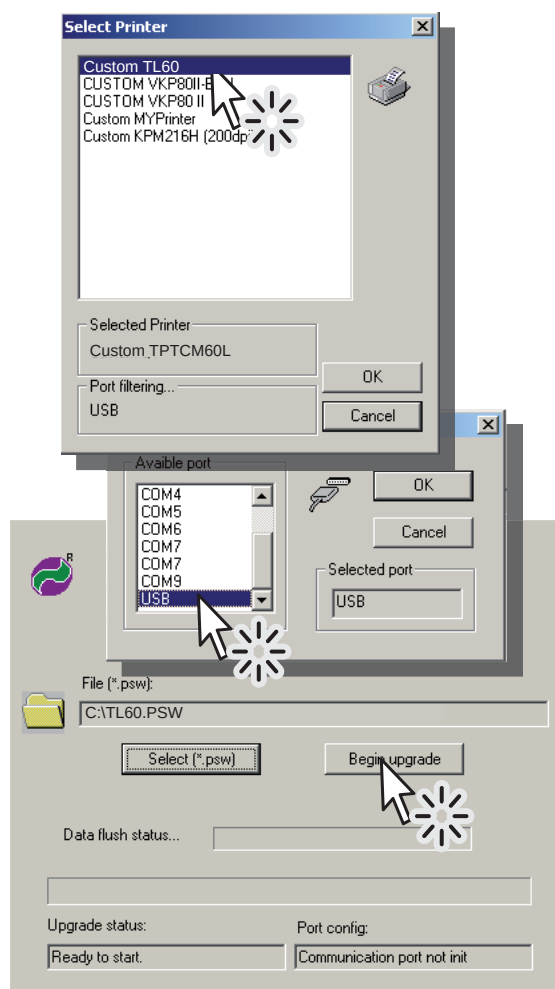
1. Print the SETUP report (see chapter 5).
2. Switch OFF the printer.

6. MAINTENANCE

3. Connect the printer to the PC using a USB cable (see paragraph 3.3).
4. Switch ON the printer.
5. Start the software UPGCEPRN.
6. Select the update file .PSW location :



7. Select item USB and then select the USB device among those proposed (ex. TL60):



7 SPECIFICATIONS

7.1 Hardware specifications

GENERAL	
Sensors	Paper presence, printing head temperature
Emulations	ESC/POS™
Printing driver	Windows XP, VISTA (32/64bit), Windows 7 (32/64bit)
INTERFACES	
RS232 serial connector	from 1200 to 115200 bps
USB connector	1.1
MEMORIES	
Flash memory	1 Mbytes
Receive buffer	2 Kbytes
Graphic memory	2 Logos 448 x 584 dots (TL60) 2 Logos 608 x 430 dots (TL80)
PRINTER	
Resolution	203 DPI (8 dot/mm)
Printing method	Thermal, fixed head
Head life ⁽¹⁾	50 km
Printing width	52, 56 mm (TL60) 52, 56, 60, 64, 68, 72, 76, 80 mm (TL80)
Printing mode	Normal, 180°
Printing format	Height/width from 1 to 4, bold, reverse, underlined, italic
Character fonts (TL60, TL80)	PC437, PC850, PC860, PC863, PC865, PC858, PC866, VISCII, U.D.P.
Character fonts ⁽²⁾ (TL60, TL80 with chinese font)	PC437, PC850, PC860, PC863, PC865, PC858, GB2312
Printable barcode	UPC-A, UPC-E, EAN13, EAN8, CODE39, ITF, CODABAR, CODE93, CODE128, CODE32
Printing speed ^{(1) (3)}	140 mm/sec. (TL60) 130 mm/sec. (TL80)
PAPER	
Type of paper	Thermal rolls, heat-sensitive side on outside of roll
Recommended types of paper	from 55 g/m ² to 80 g/m ² (KANZAN KF50 or KP460, MITSUBISHI PG5075 or TL4000)
Paper width	63 µm ± 0,5 µm (per carta da 55 g/m ²) 85 µm ± 0,6 µm (per carta da 80 g/m ²)

7. SPECIFICATIONS

Maximum paper width	60 mm $\pm$ 0,5mm (TL60) 80 mm $\pm$ 0,5mm (TL80)
External roll diameter	max 80 mm (TL60) max 90 mm (TL80)
Paper end	Not attached to roll core
Internal roll core diameter	13 mm (TL60) 25 mm (TL80)
Core type	Cardboard or plastic
Minimum ticket length ⁽⁴⁾	40 mm (TL60) 40 mm (TL80)

CUTTER

Paper cut	Total and partial
Estimated life ⁽¹⁾	1 000 000 tagli (TL60) 300 000 tagli (TL80)

ELECTRICAL SPECIFICATIONS TL60, TL80

Power supply	24 Vdc $\pm$ 10%
Medium consumption ⁽³⁾	0,7 A (TL60) 0,9 A (TL80)
Stand-by consumption	0,05 A

ELECTRICAL SPECIFICATIONS POWER SUPPLY cod. 964GE010000335 FOR TL60 (OPTIONAL)

Power supply voltage	from 90V to 264V
Frequence	from 47Hz to 63Hz
Current (output)	3,2 A max
Power	75 W

ELECTRICAL SPECIFICATIONS POWER SUPPLY cod. 964GE010000362 FOR TL80 (OPTIONAL)

Power supply voltage	from 88Vac to 264Vac
Frequence	from 47Hz to 63Hz
Current (output)	4,5 A
Power	100 W

ENVIRONMENTAL CONDITIONS

Operating temperature	from 0°C to +50°C
Relative humidity	from 10% Rh to 80% Rh
Storage temperature	from -20 °C to +70 °C
Storage relative humidity	from 10% Rh to 90% Rh

NOTES:

(1) : Respecting the regular schedule of cleaning for the device components.

(2) : For further information refer to the command manual for managing chinese fonts.

(3) : Referred to a standard CUSTOM receipt (L = 10cm, Density = 12,5% dots on).

(4) : In the case of a printing length of less than 40 mm, the printer automatically corrects the length to 40 mm.

7.2 Character specifications

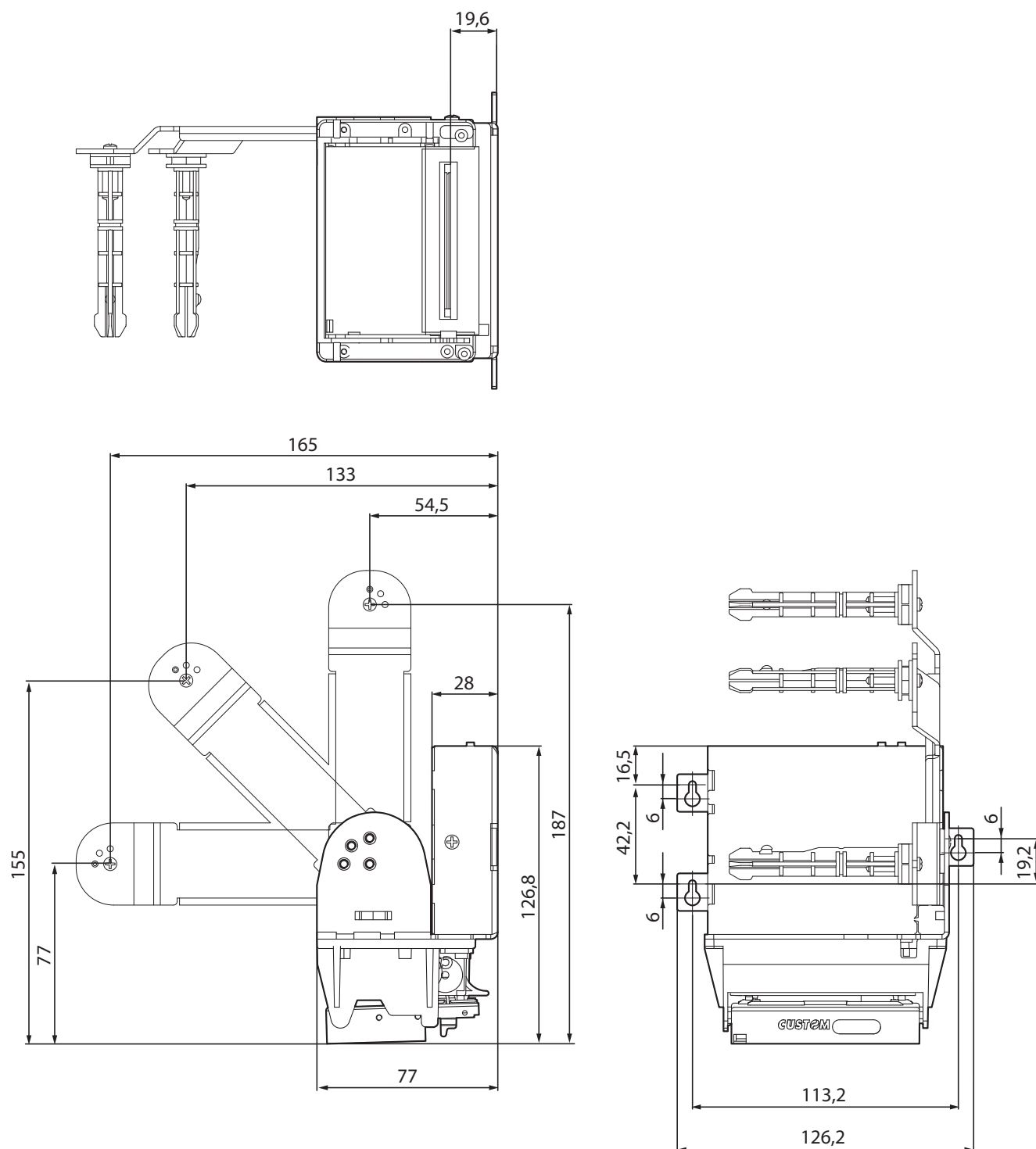
ESC/POS™ EMULATION						
Model	TL60			TL80		
Character density	11 cpi	15 cpi	20 cpi	11 cpi	15 cpi	20 cpi
Number of columns	24	32	44	33	43	60
Chars / sec	720	960	1320	990	1290	1800
Lines / sec	30	30	30	30	30	30
Character (L x H mm)						
Normal	2,2 x 3	1,7 x 3	1,2 x 3	2,2 x 3	1,7 x 3	1,2 x 3

7. SPECIFICATIONS

7.3 Printer dimensions: TL60

Length	126,8 mm
Height	77 mm
Width	126,2 mm
Weight	800 g

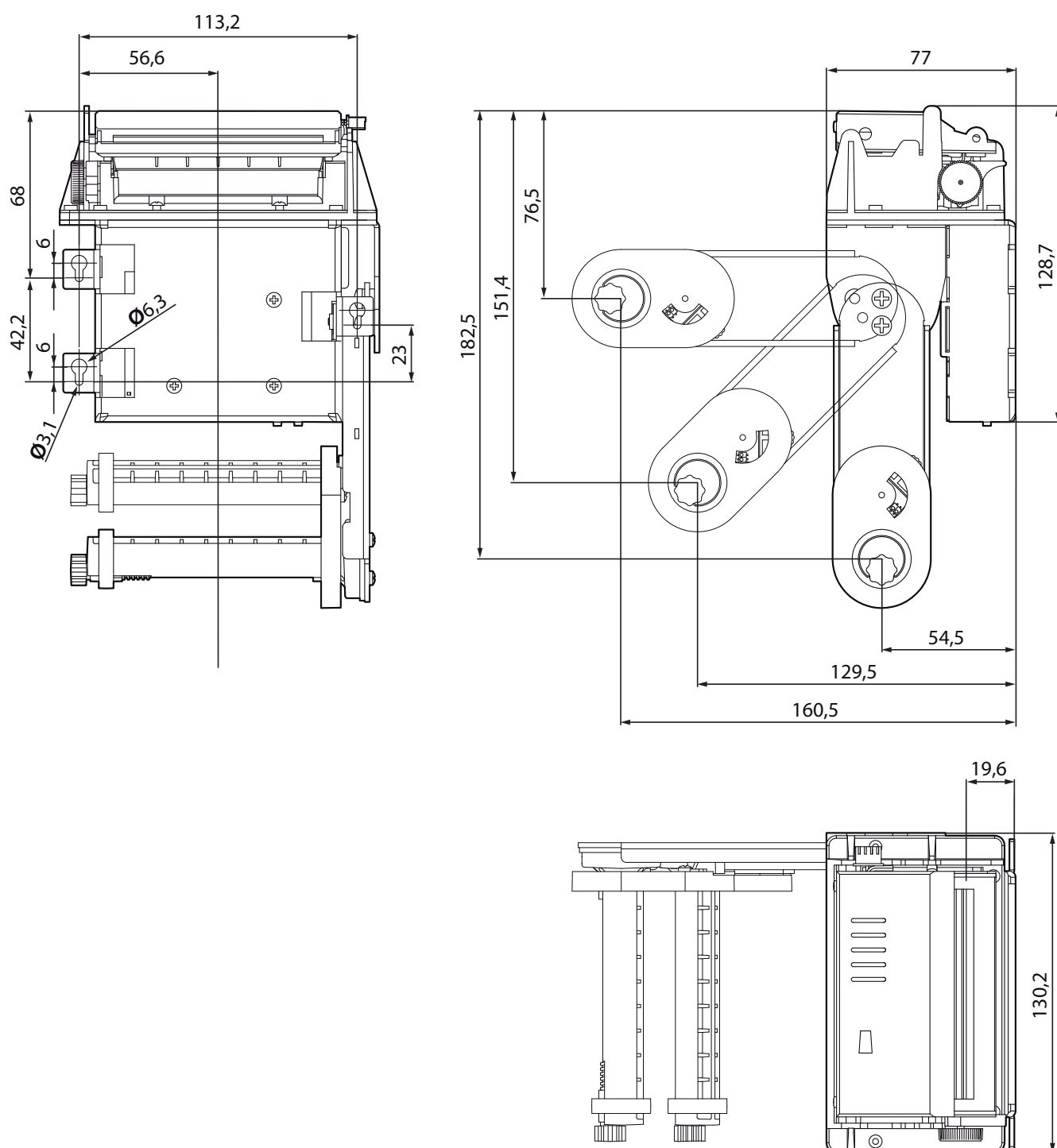
NOTE: Referred to the printer without paper roll holder support.



7.4 Printer dimensions: TL80

Length	128,7 mm
Height	77 mm
Width	130,2 mm
Weight	900 g

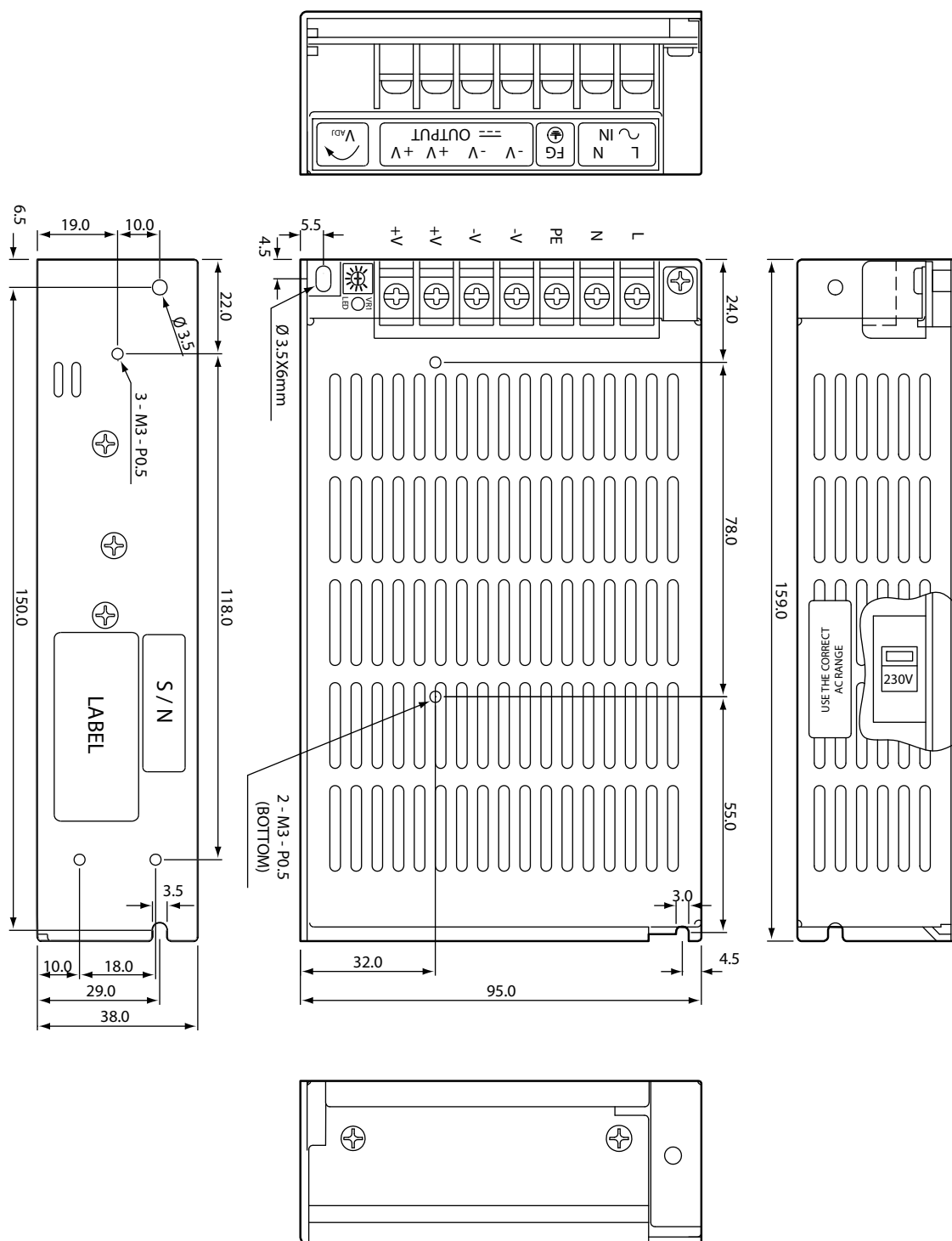
NOTE: Referred to the printer without paper roll holder support.



7. SPECIFICATIONS

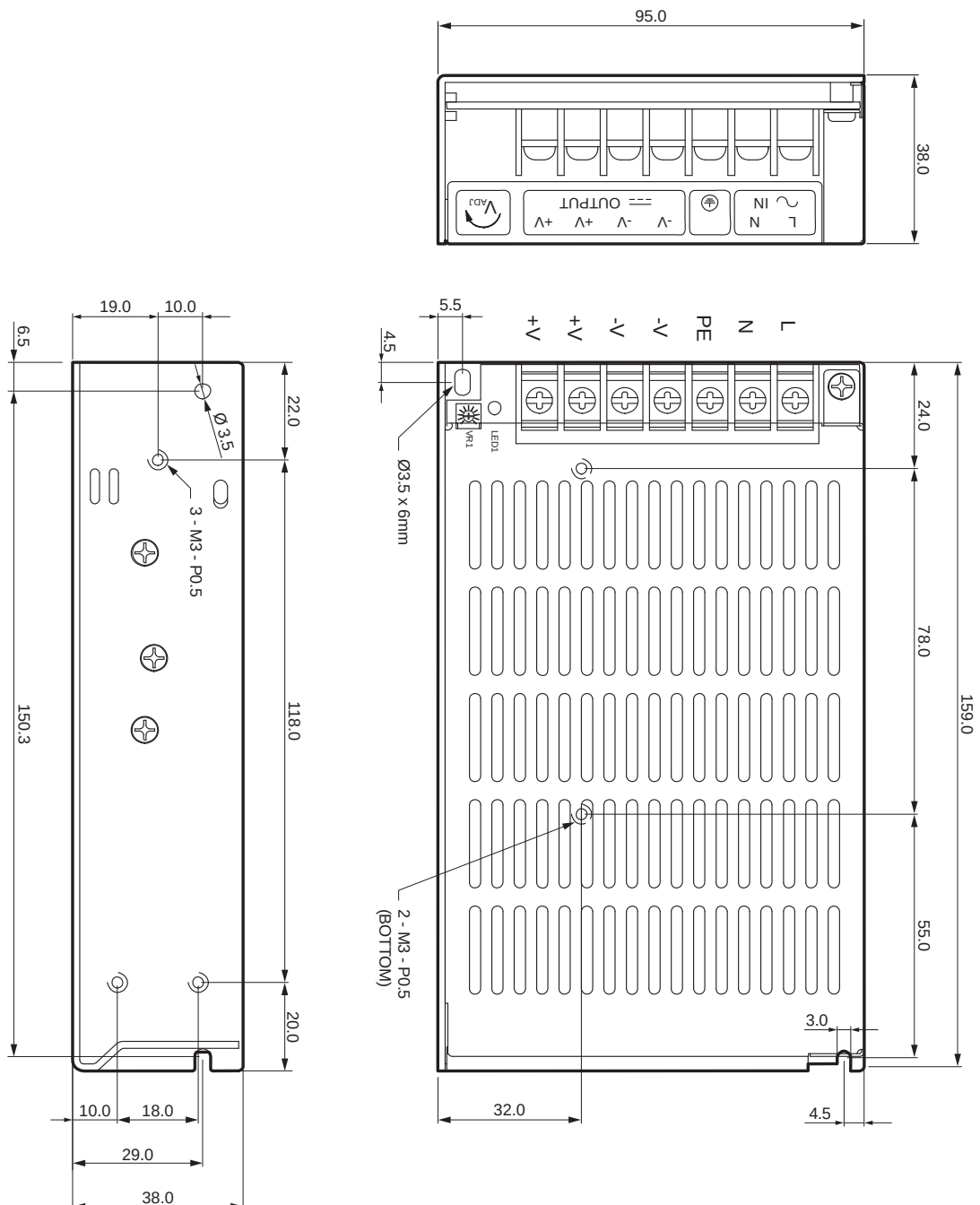
7.5 Power supply dimensions cod. 964GE010000335 for TL60 (optional)

Length	159 mm
Height	38 mm
Width	95 mm



7.6 Power supply dimensions cod. 964GE010000362 for TL80 (optional)

Length	159 mm
Height	38 mm
Width	95 mm

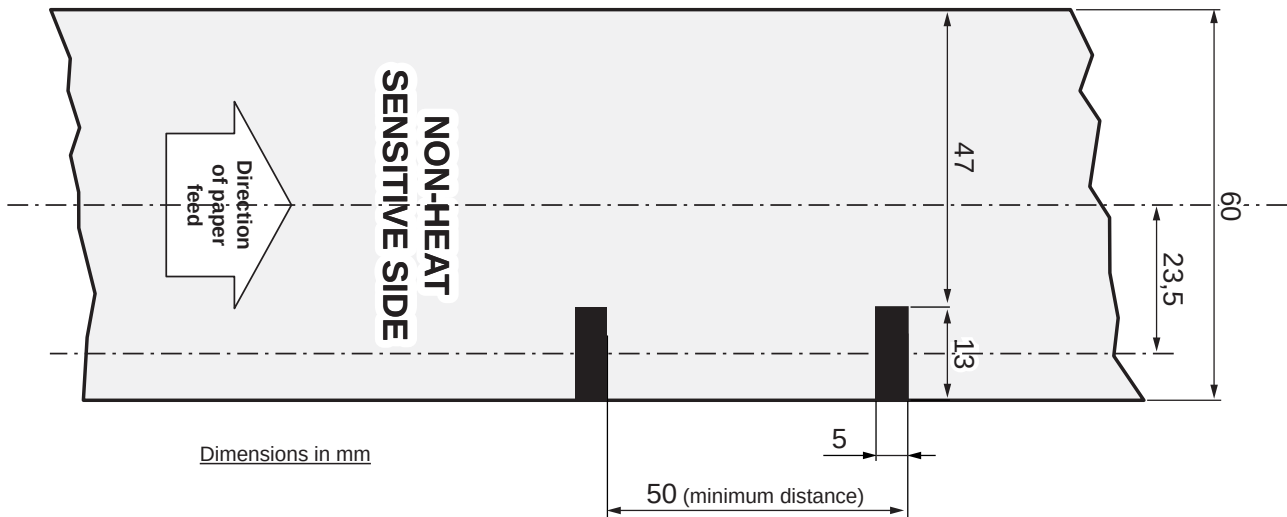


7. SPECIFICATIONS

7.7 Paper specifications

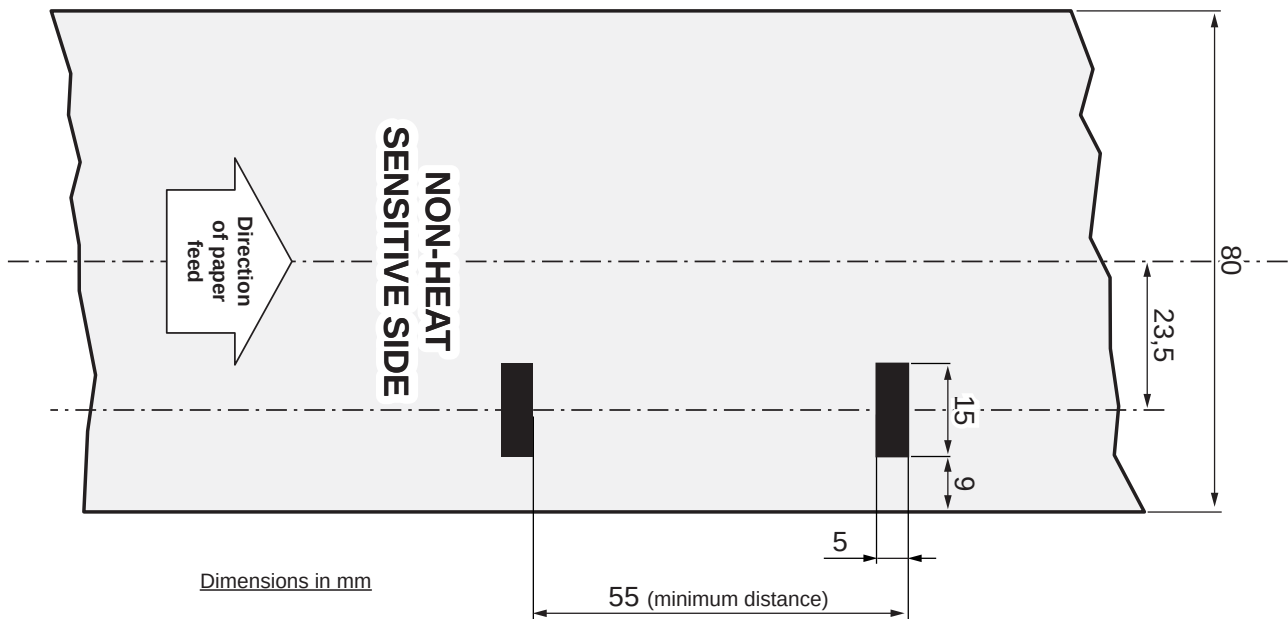
TL60 MODELS

The following figure shows a sample paper with alignment notch placed on the non-heat sensitive side of paper.



TL80 MODELS

The following figure shows a sample paper with alignment notch placed on the non-heat sensitive side of paper.



7.8 Character sets

The printer has 3 fonts of varying width (11, 15 and 20 cpi) which may be accessed through programming or control characters.

Each of these fonts offers the following code tables: PC437, PC850, PC860, PC863, PC865, PC858, PC866, VISCII, U.D.P.

PC437 CODE TABLE (Usa, Standard Europe)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Char	p	q	r	s	t	u	v	w	x	y	z	{	 	}	~	␣
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Char	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
Char	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	Pts	f
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Char	á	í	ó	ú	ñ	Ñ	ª	º	¿	¬	½	¼	¿	«	»	
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Char																
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Char																
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Char																
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Char	α	β	Γ	π	Σ	σ	μ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Char	≡	±	≥	≤	∫	∫	÷	≈	°	·	·	√	n	2	■	NBSP
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

7. SPECIFICATIONS

PC850 CODE TABLE (Multilingual)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Char	p	q	r	s	t	u	v	w	x	y	z	{		}	~	␣
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Char	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
Char	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	f
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Char	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Char	␣	␣	␣		¡	Â	À	©	¶	¶	¶	¶	¶	¢	¥	␣
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Char	Ł	ł	Ł	ł	—	†	ã	Ã	Ł	Ł	Ł	Ł	Ł	=	Ł	¤
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Char	ð	Ð	Ê	Ë	È	Ì	Í	Î	Ï	Ĵ	Ĵ	■	■	¡	ì	■
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Char	Ó	ß	Ô	Ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	ý	Ý	—	´
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Char	SHY	±	=	¾	¶	§	÷	¸	°	°	°	1	3	2	■	NBSP
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

PC860 CODE TABLE (Portuguese)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Char	p	q	r	s	t	u	v	w	x	y	z	{	 	}	~	␣
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Char	Ç	ü	é	â	ã	à	Á	ç	ê	Ê	è	í	Ô	ì	Ã	Â
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
Char	É	À	È	ô	ö	ò	Ú	ù	ì	Õ	Ü	¢	£	Ù	Þ	Ó
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Char	á	í	ó	ú	ñ	Ñ	ª	º	¿	Ò	¬	½	¼	¡	«	»
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Char																
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Char																
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Char																
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Char	α	β	Γ	π	Σ	σ	μ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Char													n	²		NBSP
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

7. SPECIFICATIONS

PC863 CODE TABLE (Canadian, French)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Char	p	q	r	s	t	u	v	w	x	y	z	{		}	~	△
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Char	Ç	ü	é	â	Â	à	¶	ç	ê	ë	è	ï	î	=	À	§
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
Char	É	È	Ê	ô	Ë	ï	û	ù	¤	Ô	Ü	¢	£	Ù	Û	f
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Char	¡	´	ó	ú	¨	¸	³	—	î	ƒ	¬	½	¼	¾	«	»
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Char	␣	␣	␣		┐	≡	≡	≡	≡	≡	≡	≡	≡	≡	≡	≡
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Char	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Char	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Char	α	β	Γ	π	Σ	σ	μ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Char	≡	±	≥	≤	∫	∫	÷	≈	°	·	·	√	n	²	■	NBSP
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

PC865 CODE TABLE (Nordic)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/	
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F	
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F	
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F	
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_	
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F	
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F	
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	
Char	p	q	r	s	t	u	v	w	x	y	z	{	 	}	~	␣	
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F	
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	
Char	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å	
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F	
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	
Char	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	Þ	ƒ	
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F	
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	
Char	á	í	ó	ú	ñ	Ñ	ª	º	¿	¬	½	¼	¡	«	»	¤	
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF	
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	
Char																	
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF	
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	
Char																	
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF	
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	
Char																	
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF	
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	
Char	α	β	Γ	π	Σ	σ	μ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩	
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF	
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	
Char	≡	±	≥	≤	∫	∫	÷	≈	°	·	·	√	n	²	■	NBSP	
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF	
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	

7. SPECIFICATIONS

PC858 CODE TABLE (Euro symbol)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Char	p	q	r	s	t	u	v	w	x	y	z	{		}	~	△
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Char	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
Char	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	f
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Char	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Char	☐	☐	☐		┌	Á	Â	À	©			¶	¶	¢	¥	⌋
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Char	L	┐	T	└	—	†	ã	Ã	ℓ	ℓ	ℓ	ℓ	ℓ	=	≠	¤
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Char	ø	Ð	Ê	Ë	È	€	Í	Î	Ï	⌋	⌋	■	■	¡	¡	■
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Char	Ó	ß	Ô	Ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	ý	Ý	—	´
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Char	SHY	±	=	¾	¶	§	÷	¸	°	°	°	1	3	2	■	NBSP
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

NOTA: Per stampare il simbolo Euro (€), la sequenza di comando è: \$1B, \$74, \$13, \$D5 (vedi Manuale Comandi).

PC866 CODE TABLE (Cyrillic)

Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/	
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F	
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?	
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F	
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F	
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_	
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F	
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F	
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	
Char	p	q	r	s	t	u	v	w	x	y	z	{	 	}	~	␣	
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F	
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	
Char	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П	
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F	
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	
Char	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я	
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F	
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	
Char	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п	
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF	
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	
Char																	
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF	
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	
Char																	
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF	
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	
Char																	
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF	
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	
Char	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	я	
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF	
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	
Char	Ё	ё	Є	є	İ	ı	Ÿ	ÿ	°	·	·	√	№	¤	■	NBSP	
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF	
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	

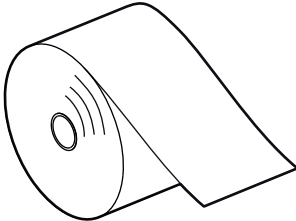
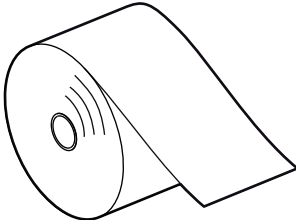
7. SPECIFICATIONS

VISCII CODE TABLE (Vietnamese standard code)

Char	NUL	SOH	À	ETX	EOT	Ã	Ä	BEL	BS	HT	LF	VT	FF	CR	SO	SI
Hex	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	000A	000B	000C	000D	000E	000F
Dec	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Char	DLE	DC1	DC2	DC3	ÿ	NAK	SYN	ETB	CAN	ÿ	SUB	ESC	FS	GS	Y	US
Hex	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	001A	001B	001C	001D	001E	001F
Dec	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Char	SP	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
Hex	0020	0021	0022	0023	0024	0025	0026	0027	0028	0029	002A	002B	002C	002D	002E	002F
Dec	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Char	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
Hex	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	003A	003B	003C	003D	003E	003F
Dec	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Char	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Hex	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	004A	004B	004C	004D	004E	004F
Dec	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Char	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
Hex	0050	0051	0052	0053	0054	0055	0056	0057	0058	0059	005A	005B	005C	005D	005E	005F
Dec	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
Char	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
Hex	0060	0061	0062	0063	0064	0065	0066	0067	0068	0069	006A	006B	006C	006D	006E	006F
Dec	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Char	p	q	r	s	t	u	v	w	x	y	z	{		}	~	DEL
Hex	0070	0071	0072	0073	0074	0075	0076	0077	0078	0079	007A	007B	007C	007D	007E	007F
Dec	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
Char	À	Á	Â	Ã	Ä	Å	Ä	Å	Ä	Å	Ä	Å	Ä	Å	Ä	Å
Hex	0080	0081	0082	0083	0084	0085	0086	0087	0088	0089	008A	008B	008C	008D	008E	008F
Dec	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
Char	Ò	Ó	Ô	Õ	Ö	Ø	Ù	Ú	Û	Ü	Ý	Þ	Ë	Ì	Í	Î
Hex	0090	0091	0092	0093	0094	0095	0096	0097	0098	0099	009A	009B	009C	009D	009E	009F
Dec	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
Char	Ö	á	â	ă	Á	à	â	ă	ẽ	ẹ	ê	è	ê	ẽ	ệ	ố
Hex	00A0	00A1	00A2	00A3	00A4	00A5	00A6	00A7	00A8	00A9	00AA	00AB	00AC	00AD	00AE	00AF
Dec	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
Char	ò	ỏ	õ	ỡ	ơ	ộ	ờ	ở	ị	ự	ứ	ừ	ử	ơ	ớ	ư
Hex	00B0	00B1	00B2	00B3	00B4	00B5	00B6	00B7	00B8	00B9	00BA	00BB	00BC	00BD	00BE	00BF
Dec	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
Char	À	Á	Â	Ã	Ä	Å	ä	å	È	É	Ê	Ë	Ì	Í	Î	ÿ
Hex	00C0	00C1	00C2	00C3	00C4	00C5	00C6	00C7	00C8	00C9	00CA	00CB	00CC	00CD	00CE	00CF
Dec	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
Char	Đ	ư	ò	ó	ô	ạ	ỷ	ừ	ử	ù	ú	ỹ	ỵ	ý	ơ	ư
Hex	00D0	00D1	00D2	00D3	00D4	00D5	00D6	00D7	00D8	00D9	00DA	00DB	00DC	00DD	00DE	00DF
Dec	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
Char	à	á	â	ã	ä	å	ÿ	ä	è	é	ê	ë	ì	í	î	ï
Hex	00E0	00E1	00E2	00E3	00E4	00E5	00E6	00E7	00E8	00E9	00EA	00EB	00EC	00ED	00EE	00EF
Dec	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
Char	đ	ư	ò	ó	ô	õ	ồ	ọ	ụ	ù	ú	ũ	ủ	ý	ợ	ư
Hex	00F0	00F1	00F2	00F3	00F4	00F5	00F6	00F7	00F8	00F9	00FA	00FB	00FC	00FD	00FE	00FF
Dec	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

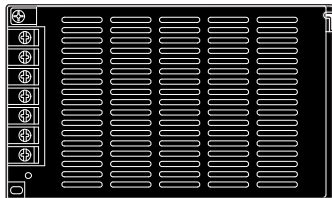
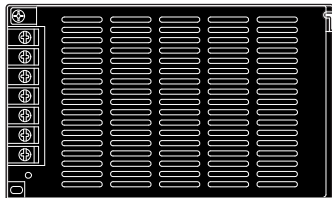
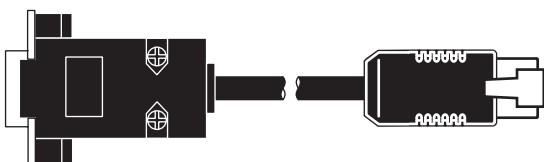
8 CONSUMABLES

The following table shows the list of available consumables for device:

DESCRIPTION	CODE
THERMAL PAPER ROLL FOR TL60 width = 60mm Ø external = 80mm Ø core = 12mm	67300000000362 
THERMAL PAPER ROLL FOR TL80 width = 80mm Ø external = 90mm Ø core = 25mm	67300000000406 

9 ACCESSORIES

The available accessories for the device are listed in the following table:

DESCRIPTION	CODE
	964GE010000335
POWER SUPPLY 24V 75W FOR TL60 (for technical specifications, see the paragraph 7.1)	
	964GE010000362
POWER SUPPLY 24V 100W FOR TL80 (for technical specifications, see the paragraph 7.1)	
	26500000000356
USB cable A to B - 1,8 mt (WRDATI-USB-MM-AB-1.8-3)	
	26500000000311
RJ/DB9F serial cable - 1,5 mt (CB9POLI-PLUG8-03)	

10 ALIGNMENT

Device is provided with a sensor for the use of alignment notch in order to handle:

- roll of tickets with pre-printed fields and a fixed length;

The alignment notch may be formed by

- black mark printed on paper (see par.7.7);

All alignment sensors are “reflection” sensors: this kind of sensor emits a band of light and detects the quantity of light reflected to it. The presence of the notch is therefore detected by the amount of light that returns to the sensor, considering that the light is reflected by the white paper and absorbed by the black mark.

The following paragraphs show how to correctly set the configuration parameters of device in order to assure the alignment.

10.1 Enable alignment

To guarantee the alignment, it is necessary to enable the parameter “Notch alignment” during the Setup procedure (see chapter 5).

10.2 Calibration

The sensor calibration occurs automatically and consists in adjusting the quantity of light emitted to match the degree of whiteness of the paper used and the degree of black of the mark printed on paper.

The device automatically performs the self-calibration during the Setup procedure only if the “Notch alignment” parameter is set to “Enabled” (see chapter 5).

When self-calibration starts, the device performs some paper feeds and then it prints the calibration result and the value of the PWM duty-cycle of the alignment sensor driver so that it can be perform an optimal notch detection:

Autosetting Notch : OK
PWM Duty Cycle : 85.3%

The “Autosetting Notch” parameter indicates the result of the self-calibration procedure; OK will appear if it has been successful, NOT OK will appear if the procedure has failed.

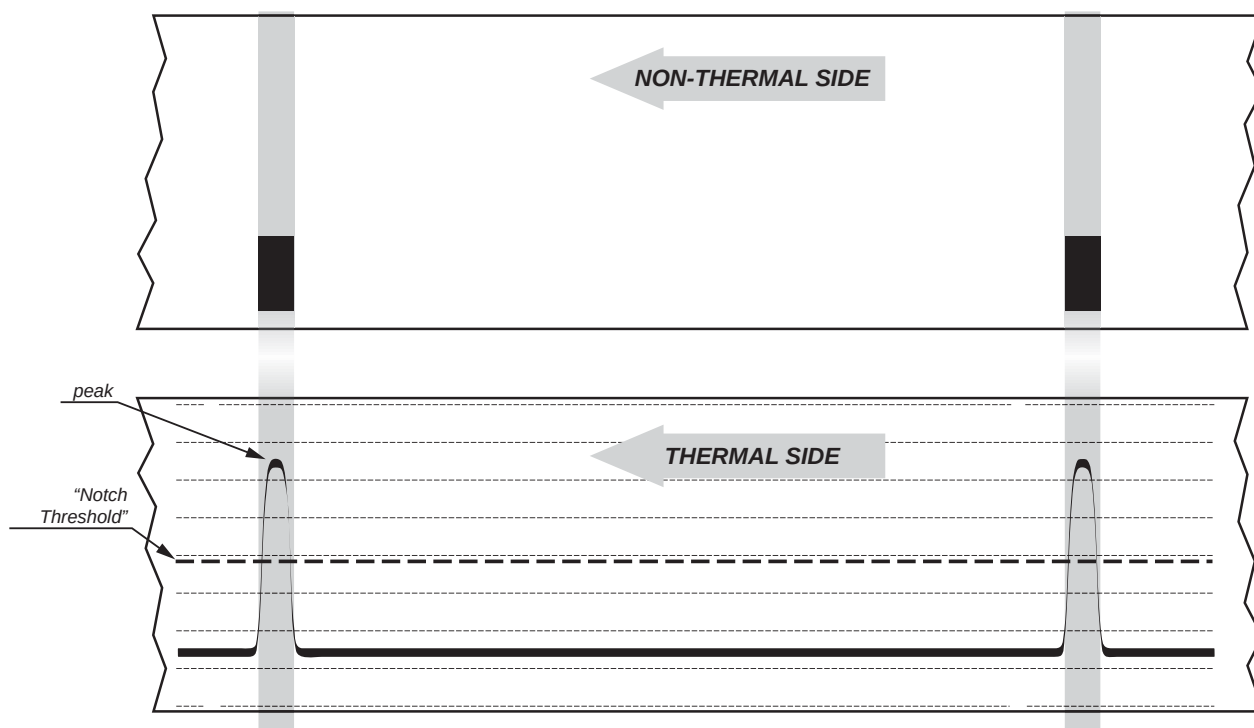
After the printing of the procedure result, the device offers the execution of the function of paper characterization “Characterize Paper” and the change of the “Notch Threshold” parameter which represents the detection threshold of the notch.

Choosing the “Yes” value for the “Characterize Paper” parameter, the device prints a graphic representation (see following figures) of the outgoing voltage of the alignment sensor (expressed as a percentage) and the “Notch Threshold” value.

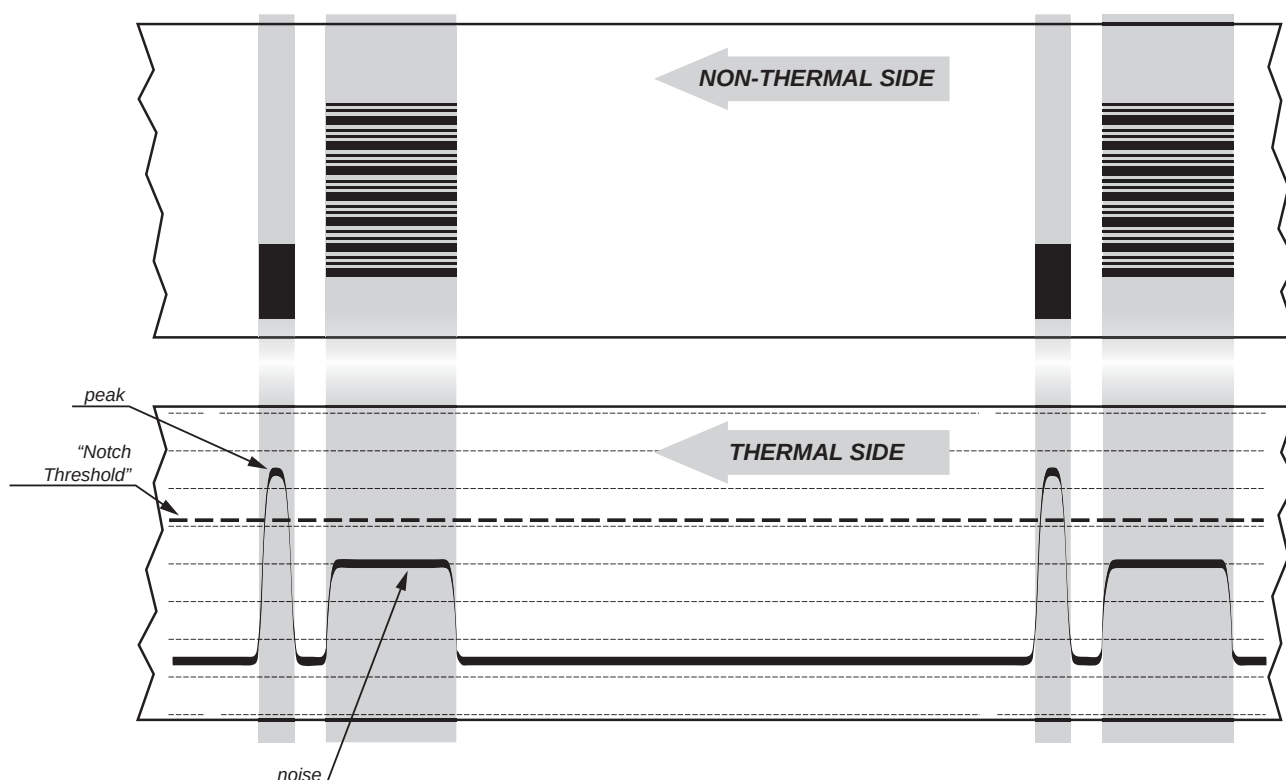
This graphic representation is useful to set the most suitable value to assign to the “Notch Threshold” parameter and then to better identify the optimal threshold value which takes into account the variations of the signal and the small oscillations around zero.

10. ALIGNMENT

The following figure shows an example of paper with the non-thermal paper printed with black marks: the outgoing voltage is constant while passing the white paper between two notches and presents a peak at each black mark. In this case, the optimal value for the “Notch Threshold” parameter is placed about half of the peak.



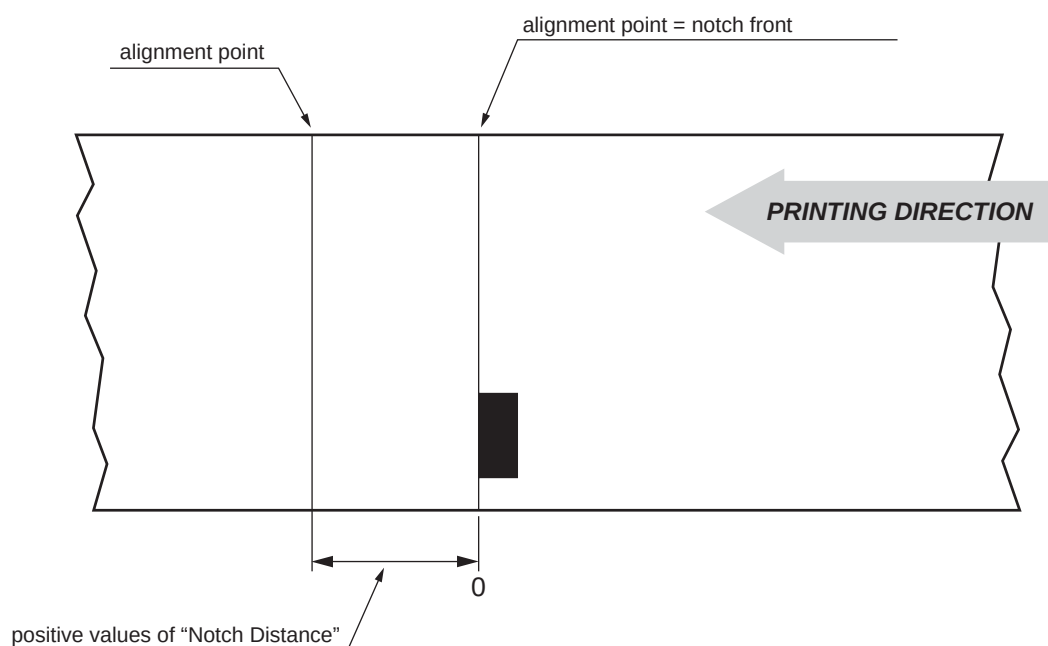
The following figure shows an example of paper with the non-thermal paper printed with black marks and other graphics (for example, a barcode): the outgoing voltage is constant while passing the white paper between two notches, presents a peak at each black mark and presents some “noise” at each barcode. In this case, the optimal value for the “Notch Threshold” parameter is located about halfway between the peak value and the maximum value of the “noise”.



If the maximum value of “noise” read by the sensor is very close to the peak value, it might be difficult to place the value of the “Notch Threshold” at an intermediate point. In these cases, it is mandatory that the portion of paper between the point of printing end and the front notch is completely white (no graphics). In this way, the only next graphic detected by the sensor for alignment after the printing end will be the notch.

10.3 Alignment parameters

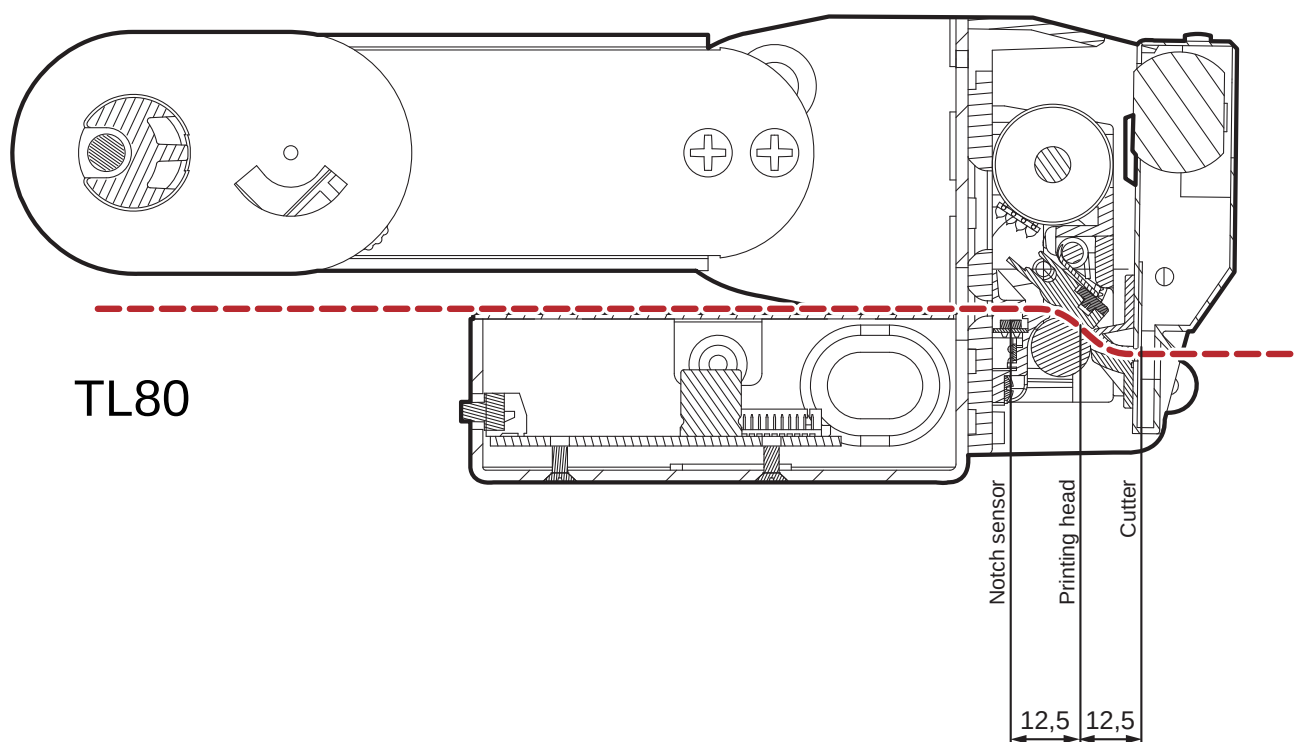
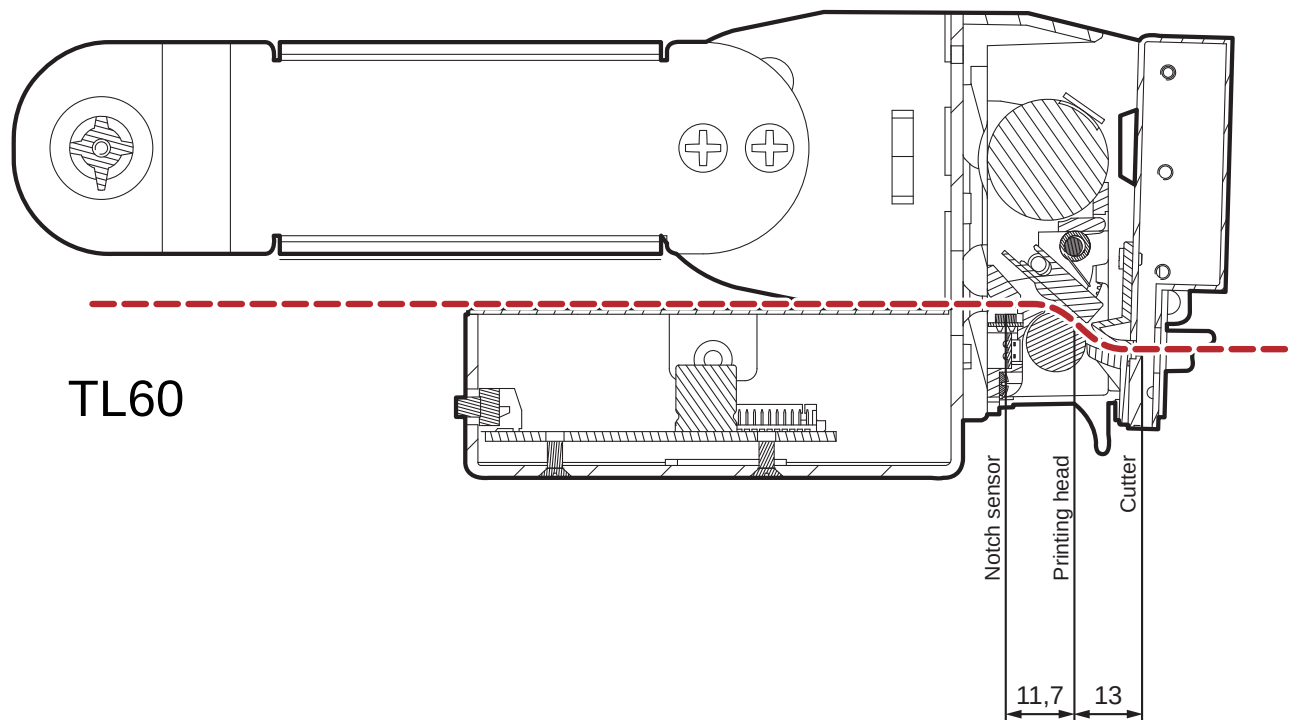
The “alignment point” is defined as the position inside the ticket to use for the notch alignment. The distance between the notch edge and the alignment point is defined as “Notch Distance”. If the “Notch Distance” value is set to 0, the alignment point is set at the beginning of the notch.



The “Notch Distance” value can have a minimum value of 0mm and a maximum of 12,9mm. This maximum value is imposed by the mechanical distance between the notch sensor and the printing head.

10. ALIGNMENT

The following figure shows a section of the device with the paper path and the distances (in mm) between the alignment sensors, the printing head and the cutter (cutting line).



ESC/POS™ EMULATION

To define the alignment point you need to set the printer parameters that compose the numerical value of the “Notch Distance” parameter (see par.5.4).

For example, to set a notch distance of 10 mm between the notch and the alignment point, the parameters must be set on the following values:

<i>Notch Distance [mm x 10]</i>	: 1
<i>Notch Distance [mm x 1]</i>	: 0
<i>Notch Distance [mm x .1]</i>	: 0

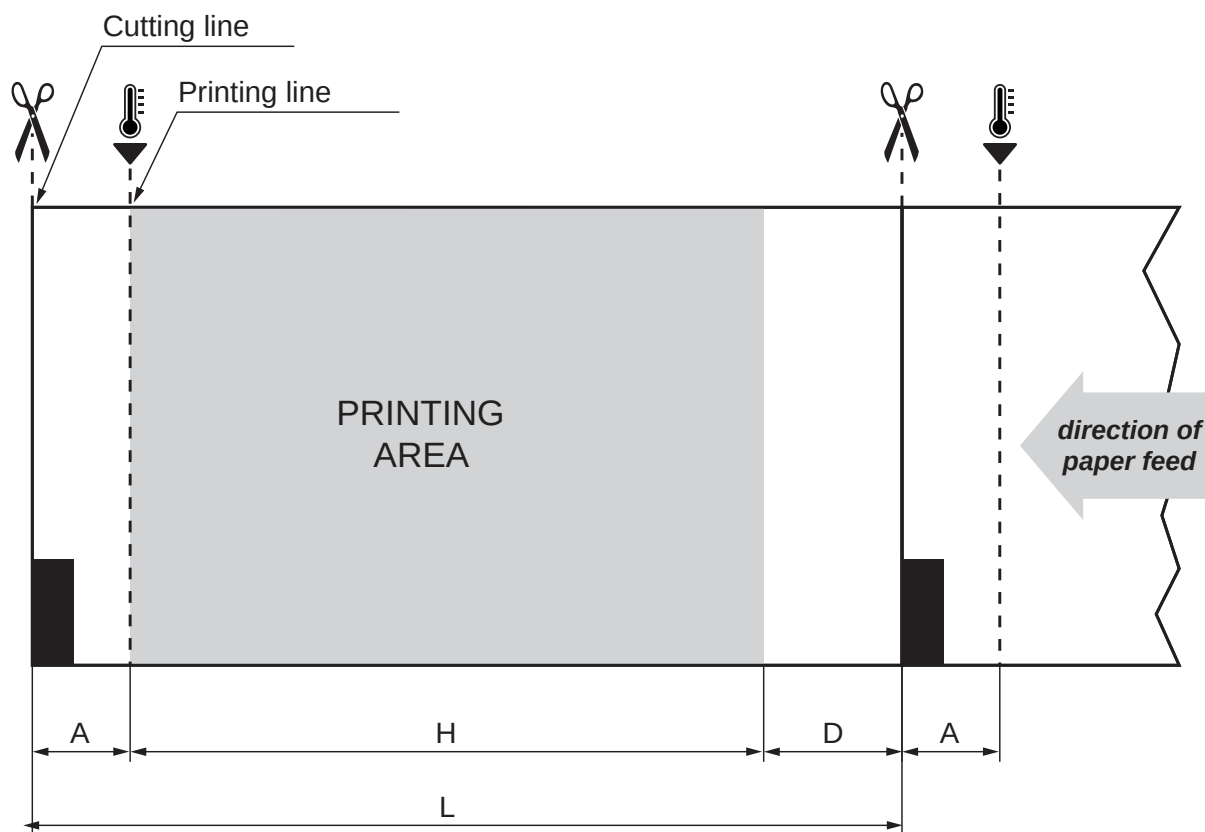
The “Notch Distance” parameter, may be modified as follows:

- during the Setup procedure of the device (see chapter 5)
- by using the \$1D \$E7 command (for more details, refer to the Commands Manual)
- by driver (facility tool).

10.4 Printing area

It is important to well calibrate the height of the printing area of ticket according to the inter-notch distance, in order to print ticket containing only one notch and to not overlay printing to a notch (that will make it useless for the next alignment).

The following figure shows an example of tickets with “Notch Distance” set to 0:



To use all the notches on the card, you must comply with the following equation:

$$L \geq H + A$$

where

L = INTER-NOTCH DISTANCE

A = NON-PRINTABLE AREA (TL60 = 13mm), (TL80 = 12.5mm)

H = HEIGHT OF THE PRINTING AREA

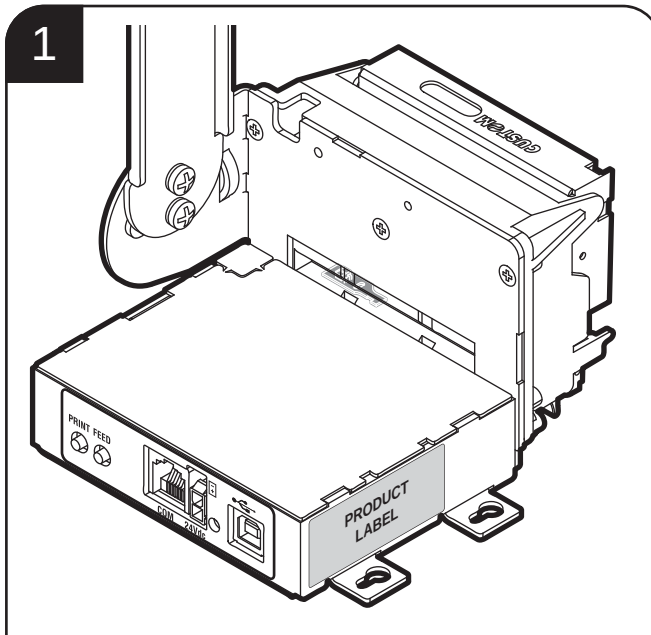
The height of the printing area (H) can be increased to make no progress on alignment (D = 0) but no further.

11 TECHNICAL SERVICE

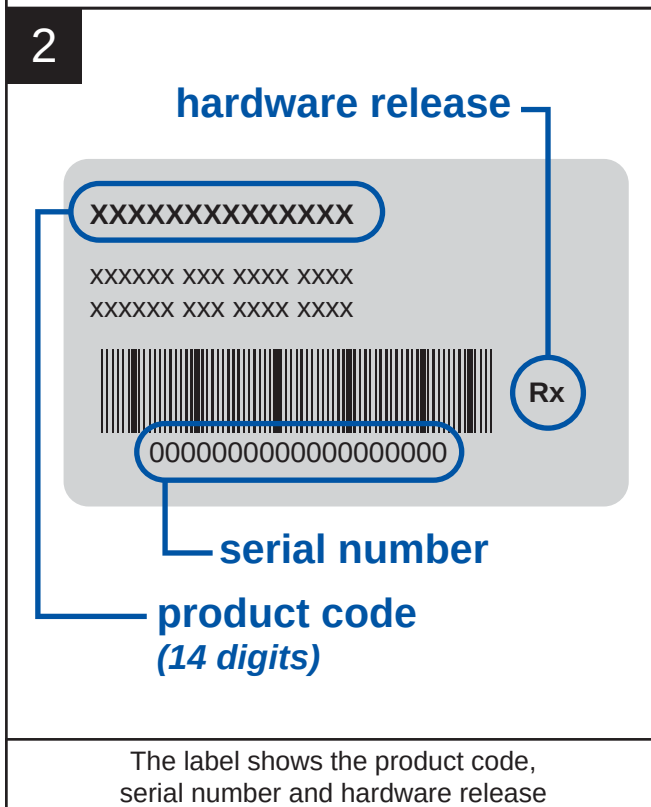
In case of failure, contact the Technical Service by sending an e-mail to support@custom.it detailing:

1. Product code
2. Serial number
3. Hardware release
4. Firmware release

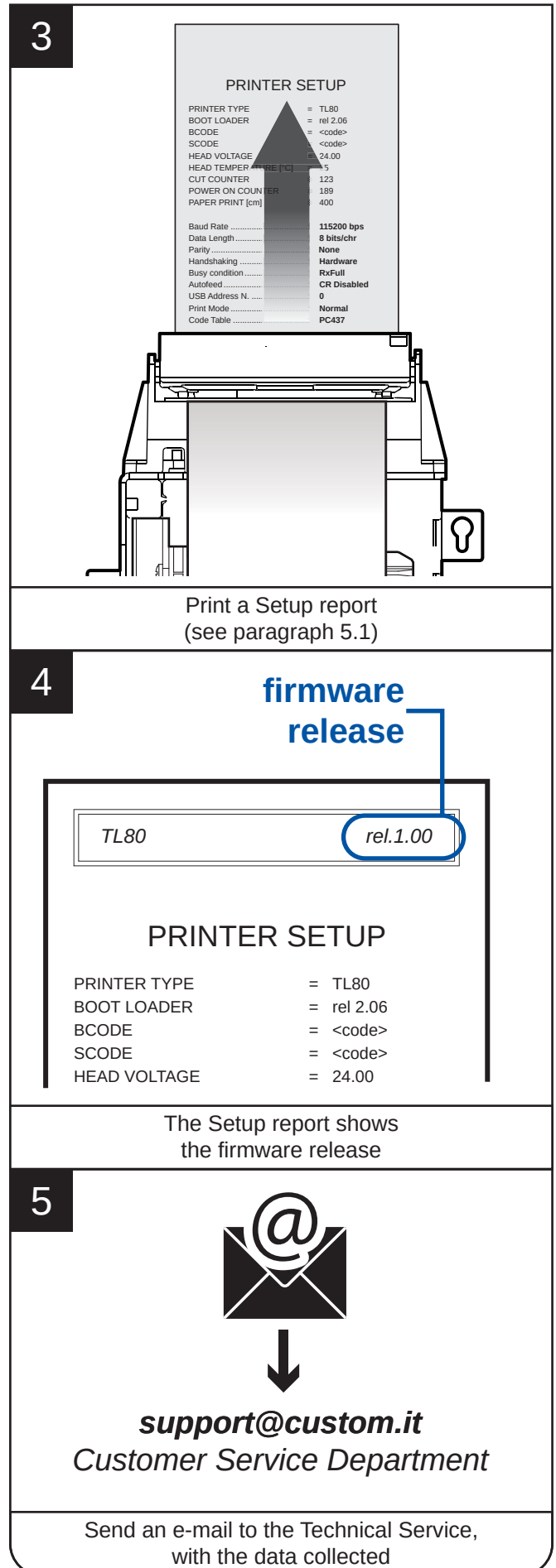
To get the necessary data, proceed as follows:



Find the product label located on the side of the printer



The label shows the product code, serial number and hardware release



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Ministry University
Research Scientific
T e c h n o l o g y
Authorized laboratory
n o . 5 0 8 4 6 Z Y Z

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